Computer algebra independent integration tests

3-Logarithms/3.1.4-f-x-^m-d+e-x^r-^q-a+b-log-c-x^n-^p

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Contents

Chapter 1

Introduction

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

The number of integrals in this report is [456]. This is test number [57].

1.1 Listing of CAS systems tested

The following systems were tested at this time.

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

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

Sympy was called directly using Python.

1.2 Results

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

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

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

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

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

System	solved	Failed
Rubi	% 100.00 (456)	% 0.00 (0)
Mathematica	% 98.46 (449)	% 1.54 (7)
Maple	% 67.76 (309)	% 32.24 (147)
Maxima	% 53.73 (245)	% 46.27 (211)
Fricas	% 61.40 (280)	% 38.60 (176)
Sympy	% 50.66 (231)	% 49.34 (225)
Giac	% 43.86 (200)	% 56.14 (256)
Mupad	% 32.02 (146)	% 67.98 (310)

Table 1.1: Percentage solved for each CAS

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

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

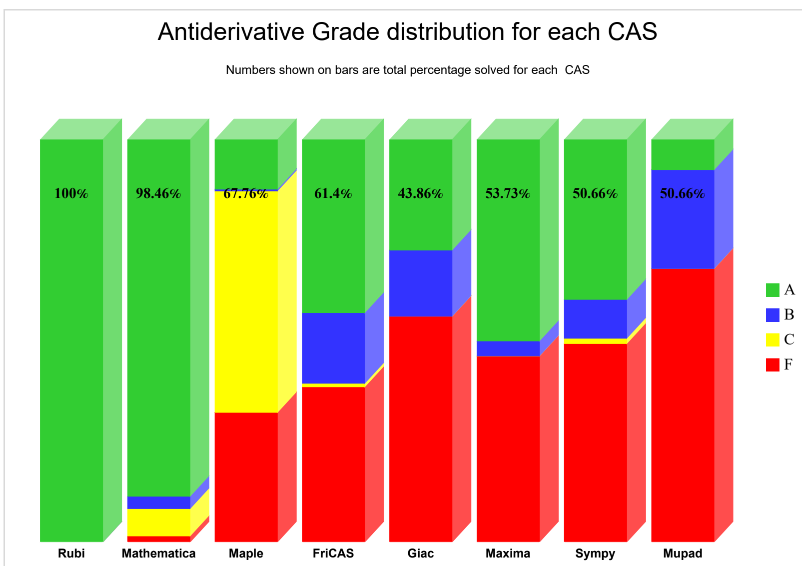
Table 1.2: Description of grading applied to integration result

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

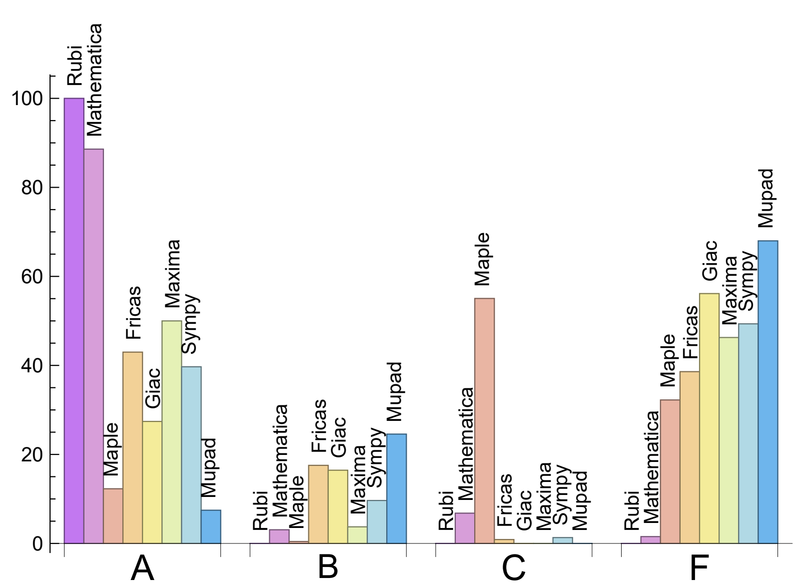
System	% A grade	% B grade	% C grade	% F grade
Rubi	100.00	0.00	0.00	0.00
Mathematica	88.60	3.07	6.80	1.54
Maple	12.28	0.44	55.04	32.24
Maxima	50.00	3.73	0.00	46.27
Fricas	42.98	17.54	0.88	38.60
Sympy	39.69	9.65	1.32	49.34
Giac	27.41	16.45	0.00	56.14
Mupad	7.46	24.56	0.00	67.98

Table 1.3: Antiderivative Grade distribution of each CAS

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



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



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

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

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

System	Number failed	Percentage normal failure	Percentage time-out failure	Percentage exception failure
Rubi	0	0.00 %	0.00 %	0.00 %
Mathematica	7	100.00 %	0.00 %	0.00 %
Maple	147	100.00 %	0.00 %	0.00 %
Maxima	211	86.26 %	0.00 %	13.74 %
Fricas	176	92.61 %	0.00 %	7.39 %
Sympy	225	48.89 %	49.33 %	1.78 %
Giac	256	99.61 %	0.00 %	0.39 %
Mupad	310	100.00 %	0.00 %	0.00 %

Table 1.4: Time and leaf size performance for each CAS

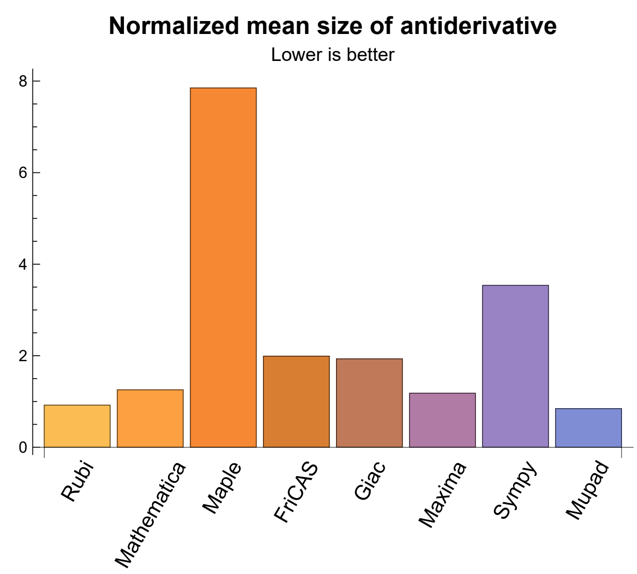
1.3 Performance

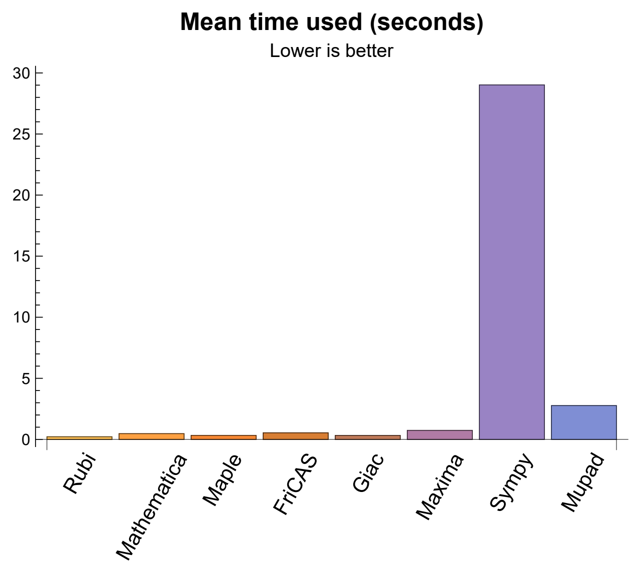
The table below summarizes the performance of each CAS system in terms of CPU time and leaf size of results.

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.22	148.03	0.92	119.00	1.00
Mathematica	0.47	167.21	1.25	125.00	1.01
Maple	0.33	1024.20	7.85	587.00	5.30
Maxima	0.74	119.76	1.18	109.00	1.17
Fricas	0.54	262.16	1.99	159.00	1.67
Sympy	29.02	379.75	3.54	204.00	1.98
Giac	0.32	222.01	1.93	140.00	1.52
Mupad	2.77	79.42	0.85	82.00	1.01

Table 1.5: Time and leaf size performance for each CAS

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





1.4 list of integrals that has no closed form antiderivative

{127, 128, 129, 157, 158, 159, 160, 161, 166, 167, 168, 170, 249, 250, 322, 323, 327, 328, 406, 407, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 444, 445, 452, 453}

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

Rubi {}

Mathematica {166, 167, 168, 170, 322, 323, 406, 407, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 444, 445}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.6 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {166, 167, 170, 282, 291, 302, 303, 313, 314, 322, 323, 324, 355, 363, 364, 365, 366, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 424, 425, 426, 430, 431, 432, 444, 445}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Mupad Verification phase not implemented yet.

1.7 Timing

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

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

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

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

1.8 Verification

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

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

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

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

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

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

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

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

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

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

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

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

1.9.2 Important note about FriCAS and Giac/XCAS results

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

These will fail With error `Exception raised: NotImplementedError`

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

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

1.9.3 Important note about finding leaf size of antiderivative

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

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

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

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

```
try:
```

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

except Exception as ee:
        leafCount =1
```

1.9.4 Important note about Mupad results

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

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

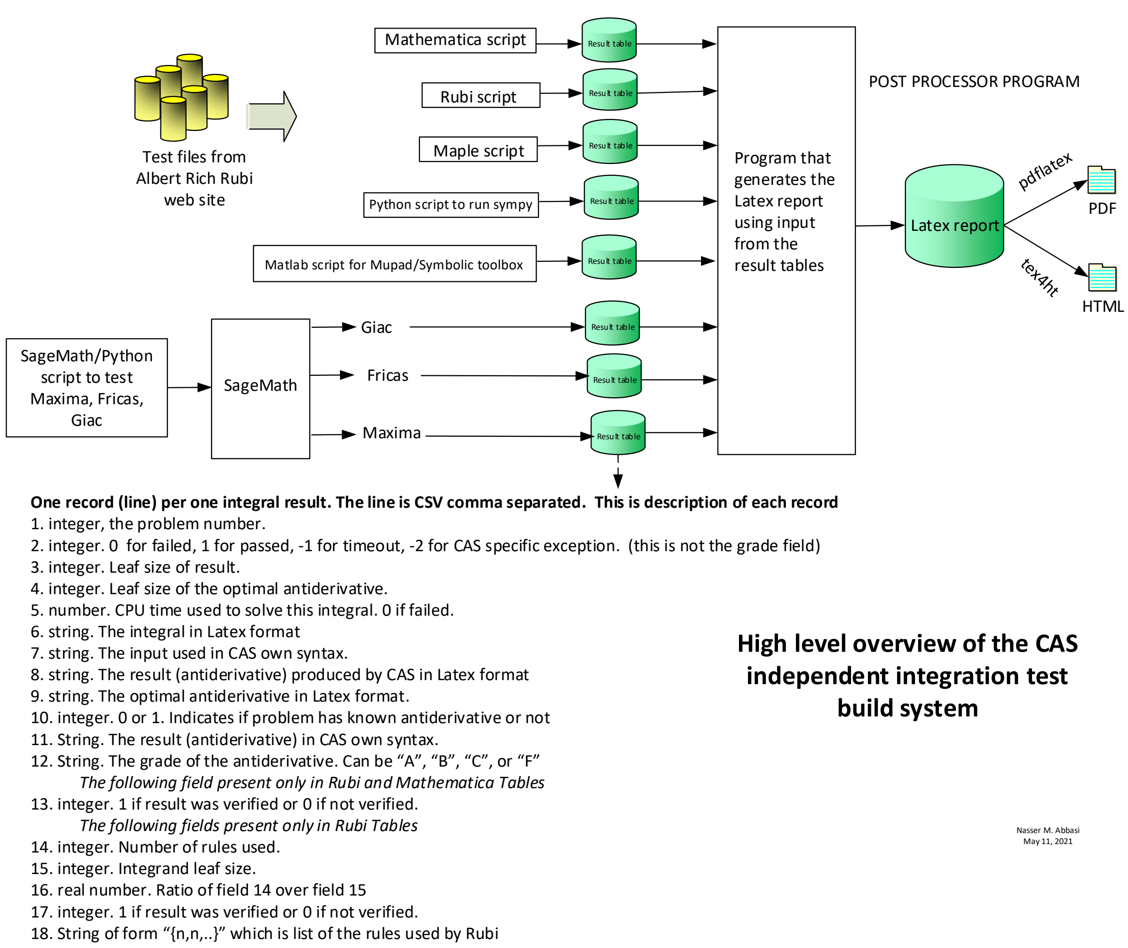
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

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

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

1.10 Design of the test system

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



Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456 }

B grade: { }

C grade: { }

F grade: { }

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 57, 58, 59, 60, 61, 62, 63, 64, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 116, 117, 118, 119, 120, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 214, 215, 216, 217, 218, 219, 220, 223, 226, 227, 228, 229, 230, 232, 233, 241, 242, 243, 245, 246, 247, 249, 250, 251, 252, 253, 260, 261, 262, 263, 264, 265, 272, 273, 274, 275, 276, 277, 278, 282, 283, 284, 285, 286, 287, 288, 289, 293, 294, 295, 296, 297, 298, 299, 300, 305, 306, 307, 308, 309, 310, 311, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 432, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456 }

B grade: { 56, 65, 115, 121, 213, 236, 237, 238, 239, 240, 244, 363, 430, 431 }

C grade: { 221, 222, 224, 225, 231, 234, 235, 248, 254, 255, 256, 257, 258, 259, 266, 267, 268, 269, 270, 271, 279, 280, 281, 290, 291, 292, 301, 302, 303, 304, 312 }

F grade: { 433, 434, 435, 436, 437, 438, 439 }

2.1.3 Maple

A grade: { 4, 5, 74, 75, 127, 128, 129, 147, 157, 158, 159, 160, 161, 166, 167, 168, 170, 241, 243, 244, 249, 250, 275, 322, 323, 327, 328, 337, 338, 339, 340, 341, 343, 344, 345, 346, 347, 348, 349, 406, 407, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 420, 444, 445, 452, 453 }

B grade: { 245, 342 }

C grade: { 1, 2, 3, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 95, 96, 103, 109, 110, 115, 116, 117, 121, 162, 163, 164, 165, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 242, 246, 317, 318, 319, 320, 321, 326, 329, 330, 331, 332, 333, 334, 335, 336, 351, 352, 353, 354, 359, 360, 361, 362, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 408, 415, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 440, 441, 442, 443, 454, 455 }

F grade: { 92, 93, 94, 97, 98, 99, 100, 101, 102, 104, 105, 106, 107, 108, 111, 112, 113, 114, 118, 119, 120, 122, 123, 124, 125, 126, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 148, 149, 150, 151, 152, 153, 154, 155, 156, 169, 247, 248, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 324, 325, 350, 355, 356, 357, 358, 363, 364, 365, 366, 431, 432, 433, 434, 435, 436, 437, 438, 439, 446, 447, 448, 449, 450, 451, 456 }

2.1.4 Maxima

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 42, 49, 57, 58, 67, 68, 69, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 120, 127, 128, 129, 130, 131, 132, 133, 137, 138, 139, 140, 144, 145, 146, 147, 151, 152, 153, 154, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 223, 233, 244, 249, 250, 251, 252, 253, 260, 263, 264, 265, 272, 275, 276, 277, 278, 283, 286, 287, 288, 289, 293, 297, 298, 299, 300, 309, 310, 315, 317, 318, 319, 320, 321, 322, 323, 327, 328, 337, 338, 339, 340, 341, 342, 343, 344, 351, 352, 353, 354, 356, 357, 358, 359, 360, 361, 362, 367, 368, 369, 370, 373, 374, 375, 379, 380, 381, 382, 385, 386, 387, 392, 393, 394, 395, 398, 399, 400, 406, 407, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 421, 422, 423, 427, 428, 429, 440, 441, 442, 443, 444, 445 }

B grade: { 48, 56, 65, 66, 70, 74, 75, 232, 241, 242, 243, 345, 346, 347, 348, 349, 454 }

C grade: { }

F grade: { 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 59, 60, 61, 62, 63, 64, 71, 72, 73, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 121, 122, 123, 124, 125, 126, 134, 135, 136, 141, 142, 143, 148, 149, 150, 155, 156, 169, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 224, 225, 226, 227, 228, 229, 230, 231, 234, 235, 236, 237, 238, 239, 240, 245, 246, 247, 248, 254, 255, 256, 257, 258, 259, 261, 262, 266, 267, 268, 269, 270, 271, 273, 274, 279, 280, 281, 282, 284, 285, 290, 291, 292, 294, 295, 296, 301, 302, 303, 304, 305, 306, 307, 308, 311, 312, 313, 314, 316, 324, 325, 326, 329, 330, 331, 332, 333, 334, 335, 336, 350, 355, 363, 364, 365, 366, 371, 372, 376, 377, 378, 383, 384, 388, 389, 390, 391, 396, 397, 401, 402, 403, 404, 405, 408, 415, 420, 424, 425, 426, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 446, 447, 448, 449, 450, 451, 452, 453, 455, 456 }

2.1.5 FriCAS

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 42, 49, 57, 58, 67, 68, 74, 75, 81, 82, 83, 130, 131, 132, 133, 137, 138, 139, 140, 144, 145, 146, 147, 151, 152, 153, 154, 157, 158, 159, 160, 161, 165, 166, 167, 168, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 223, 233, 241, 242, 249, 250, 251, 252, 253, 260, 261, 262, 263, 264, 265, 272, 273, 274, 275, 276, 277, 278, 283, 284, 285, 286, 287, 288, 289, 293, 294, 295, 296, 297, 298, 299, 300, 305, 306, 307, 308, 309, 310, 315, 316, 317, 321, 322, 323, 327, 328, 348, 349, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 364, 370, 382, 395, 406, 407, 408, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 420, 421, 422, 423, 424, 443, 444, 445, 452, 453 }

B grade: { 22, 48, 56, 65, 66, 69, 70, 76, 77, 78, 79, 80, 84, 85, 86, 87, 88, 89, 90, 91, 162, 163, 164, 198, 232, 318, 319, 320, 345, 346, 347, 350, 365, 366, 367, 368, 369, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 415, 425, 426, 427, 428, 429, 440, 441, 442, 454 }

C grade: { 363, 430, 431, 432 }

F grade: { 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 59, 60, 61, 62, 63, 64, 71, 72, 73, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 134, 135, 136, 141, 142, 143, 148, 149, 150, 155, 156, 169, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 224, 225, 226, 227, 228, 229, 230, 231, 234, 235, 236, 237, 238, 239, 240, 243, 244, 245, 246, 247, 248, 254, 255, 256, 257, 258, 259, 266, 267, 268, 269, 270, 271, 279, 280, 281, 282, 290, 291, 292, 301, 302, 303, 304, 311, 312, 313, 314, 324, 325, 326, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 433, 434, 435, 436, 437, 438, 439, 446, 447, 448, 449, 450, 451, 455, 456 }

2.1.6 Sympy

A grade: { 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 21, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 36, 37, 38, 39, 40, 42, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 80, 89, 120, 127, 128, 129, 131, 132, 133, 140, 147, 151, 152, 153, 154, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 174, 175, 176, 179, 180, 181, 182, 186, 187, 188, 191, 192, 193, 194, 195, 197, 199, 200, 201, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 221, 223, 231, 242, 249, 253, 275, 278, 288, 289, 299, 317, 319, 320, 321, 322, 329, 330, 331, 332, 335, 336, 337, 338, 339, 340, 343, 344, 354, 362, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 380, 381, 382, 383, 384, 387, 388, 389, 395, 396, 400, 401, 402, 406, 407, 409, 410, 411, 412, 413, 414, 417, 418, 419, 421, 422, 423, 427, 428, 429, 442, 443, 444, 445, 454 }

B grade: { 1, 2, 3, 9, 10, 11, 12, 19, 20, 22, 27, 76, 77, 78, 79, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 130, 137, 138, 139, 171, 172, 173, 177, 178, 183, 184, 185, 189, 190, 196, 198, 202, 203, 300 }

C grade: { 35, 241, 334, 342, 348, 349 }

F grade: { 34, 41, 43, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 121, 122, 123, 124, 125, 126, 134, 135, 136, 141, 142, 143, 144, 145, 146, 148, 149, 150, 155, 156, 214, 215, 216, 217, 218, 219, 220, 222, 224, 225, 226, 227, 228, 229, 230, 232, 233, 234, 235, 236, 237, 238, 239, 240, 243, 244, 245, 246, 247, 248, 250, 251, 252, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 276, 277, 279, 280, 281, 282, 283, 284, 285, 286, 287, 290, 291, 292, 293, 294, 295, 296, 297, 298, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 318, 323, 324, 325, 326, 327, 328, 333, 341, 345, 346, 347, 350, 351, 352, 353, 355, 356, 357, 358, 359, 360, 361, 363, 364, 365, 366, 379, 385, 386, 390, 391, 392, 393, 394, 397, 398, 399, 403, 404, 405, 408, 415, 416, 420, 424, 425, 426, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 446, 447, 448, 449, 450, 451, 452, 453, 455, 456 }

2.1.7 Giac

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 42, 49, 57, 67, 127, 128, 129, 144, 145, 146, 147, 153, 154, 157, 158, 159, 160, 161, 166, 167, 168, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 223, 233, 249, 250, 251, 252, 253, 275, 317, 322, 323, 327, 328, 352, 353, 370, 382, 395, 406, 407, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 421, 422, 423, 444, 445, 452, 453 }

B grade: { 22, 48, 56, 58, 65, 66, 68, 69, 70, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 162, 163, 164, 165, 198, 232, 318, 319, 320, 321, 351, 354, 356, 357, 358, 359, 360, 361, 362, 367, 368, 369, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 385, 386, 387, 392, 393, 394, 398, 399, 400, 427, 428, 429, 440, 441, 442, 443, 454 }

C grade: { }

F grade: { 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 59, 60, 61, 62, 63, 64, 71, 72, 73, 74, 75, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 148, 149, 150, 151, 152, 155, 156, 169, 170, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 224, 225, 226, 227, 228, 229, 230, 231, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 324, 325, 326, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 355, 363, 364, 365, 366, 383, 384, 388, 389, 390, 391, 396, 397, 401, 402, 403, 404, 405, 408, 415, 420, 424, 425, 426, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 446, 447, 448, 449, 450, 451, 455, 456 }

2.1.8 Mupad

A grade: { 127, 128, 129, 157, 158, 159, 160, 161, 166, 167, 168, 170, 249, 250, 322, 323, 327, 328, 406, 407, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 444, 445, 452, 453 }

B grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 42, 48, 49, 56, 57, 58, 65, 66, 67, 68, 69, 70, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 223, 232, 233, 241, 242, 243, 244, 345, 346, 347, 348, 349, 454 }

C grade: { }

F grade: { 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 59, 60, 61, 62, 63, 64, 71, 72, 73, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 162, 163, 164, 165, 169, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 224, 225, 226, 227, 228, 229, 230, 231, 234, 235, 236, 237, 238, 239, 240, 245, 246, 247, 248, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 324, 325, 326, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 408, 415, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 446, 447, 448, 449, 450, 451, 455, 456 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	48	264	57	69	87	73	51
normalized size	1	1.00	1.00	5.50	1.19	1.44	1.81	1.52	1.06
time (sec)	N/A	0.052	0.045	0.207	0.570	0.435	2.291	0.302	3.643

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	45	264	57	69	87	73	51
normalized size	1	1.00	0.94	5.50	1.19	1.44	1.81	1.52	1.06
time (sec)	N/A	0.050	0.025	0.212	0.509	0.489	1.463	0.361	3.588

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	48	264	57	69	87	73	51
normalized size	1	1.00	1.00	5.50	1.19	1.44	1.81	1.52	1.06
time (sec)	N/A	0.036	0.022	0.220	0.514	0.432	0.875	0.307	3.631

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	41	55	52	49	61	73	62	43
normalized size	1	0.85	1.15	1.08	1.02	1.27	1.52	1.29	0.90
time (sec)	N/A	0.016	0.002	0.055	0.729	0.428	0.509	0.273	3.608

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	43	46	41	45	58	49	40
normalized size	1	1.00	0.98	1.05	0.93	1.02	1.32	1.11	0.91
time (sec)	N/A	0.049	0.002	0.058	0.740	0.424	0.513	0.234	3.590

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	43	48	250	49	50	53	56	59
normalized size	1	0.90	1.00	5.21	1.02	1.04	1.10	1.17	1.23
time (sec)	N/A	0.050	0.027	0.236	0.829	0.468	4.977	0.334	3.568

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	41	232	57	53	75	57	47
normalized size	1	1.00	0.68	3.87	0.95	0.88	1.25	0.95	0.78
time (sec)	N/A	0.049	0.024	0.149	0.643	0.464	1.039	0.319	3.702

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	48	47	235	57	57	88	58	49
normalized size	1	0.84	0.82	4.12	1.00	1.00	1.54	1.02	0.86
time (sec)	N/A	0.045	0.025	0.155	0.608	0.440	1.644	0.260	3.465

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	81	432	100	118	158	123	82
normalized size	1	1.00	1.09	5.84	1.35	1.59	2.14	1.66	1.11
time (sec)	N/A	0.090	0.054	0.223	0.667	0.437	3.917	0.389	3.688

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	81	432	100	118	151	123	82
normalized size	1	1.00	1.09	5.84	1.35	1.59	2.04	1.66	1.11
time (sec)	N/A	0.080	0.041	0.221	0.604	0.417	2.543	0.262	3.490

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	81	432	100	118	158	123	82
normalized size	1	1.00	1.09	5.84	1.35	1.59	2.14	1.66	1.11
time (sec)	N/A	0.063	0.040	0.229	0.757	0.553	1.623	0.286	3.634

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	77	414	90	110	133	109	73
normalized size	1	1.00	1.10	5.91	1.29	1.57	1.90	1.56	1.04
time (sec)	N/A	0.038	0.046	0.257	0.872	0.570	0.984	0.233	3.605

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	63	83	410	84	98	128	100	75
normalized size	1	0.79	1.04	5.12	1.05	1.22	1.60	1.25	0.94
time (sec)	N/A	0.071	0.049	0.323	0.596	0.615	0.996	0.279	3.568

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	61	76	419	83	98	109	101	99
normalized size	1	0.78	0.97	5.37	1.06	1.26	1.40	1.29	1.27
time (sec)	N/A	0.076	0.059	0.319	0.529	0.643	1.009	0.298	3.659

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	67	84	418	90	101	99	105	99
normalized size	1	0.80	1.00	4.98	1.07	1.20	1.18	1.25	1.18
time (sec)	N/A	0.079	0.059	0.244	0.507	0.506	6.465	0.287	3.693

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	76	401	100	103	134	108	82
normalized size	1	1.00	1.01	5.35	1.33	1.37	1.79	1.44	1.09
time (sec)	N/A	0.071	0.042	0.169	0.596	0.593	1.818	0.288	3.591

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	74	80	403	100	106	160	108	85
normalized size	1	0.78	0.84	4.24	1.05	1.12	1.68	1.14	0.89
time (sec)	N/A	0.076	0.044	0.169	0.640	0.723	2.753	0.323	3.732

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	74	80	403	100	106	153	108	85
normalized size	1	0.78	0.84	4.24	1.05	1.12	1.61	1.14	0.89
time (sec)	N/A	0.076	0.041	0.169	0.618	0.887	4.201	0.283	3.632

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	133	600	143	167	223	173	113
normalized size	1	1.00	1.33	6.00	1.43	1.67	2.23	1.73	1.13
time (sec)	N/A	0.106	0.067	0.225	0.859	0.953	6.490	0.251	3.577

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	133	600	143	167	230	173	113
normalized size	1	1.00	1.33	6.00	1.43	1.67	2.30	1.73	1.13
time (sec)	N/A	0.102	0.052	0.230	0.604	0.546	4.311	0.287	3.643

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	130	598	141	167	218	170	112
normalized size	1	1.00	1.07	4.90	1.16	1.37	1.79	1.39	0.92
time (sec)	N/A	0.091	0.124	0.238	0.744	0.507	2.829	0.395	3.612

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	110	571	133	159	204	159	104
normalized size	1	1.00	1.29	6.72	1.56	1.87	2.40	1.87	1.22
time (sec)	N/A	0.043	0.046	0.264	0.697	0.506	1.805	0.317	3.570

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	94	123	579	127	149	199	150	106
normalized size	1	0.77	1.01	4.75	1.04	1.22	1.63	1.23	0.87
time (sec)	N/A	0.088	0.063	0.304	0.629	0.543	1.863	0.295	3.642

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	92	118	588	127	149	182	154	154
normalized size	1	0.77	0.99	4.94	1.07	1.25	1.53	1.29	1.29
time (sec)	N/A	0.088	0.082	0.332	0.566	0.573	1.869	0.299	3.652

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	91	115	586	125	150	182	154	139
normalized size	1	0.77	0.97	4.97	1.06	1.27	1.54	1.31	1.18
time (sec)	N/A	0.091	0.081	0.334	0.630	0.560	1.970	0.285	3.594

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	98	122	589	133	151	144	155	136
normalized size	1	0.78	0.97	4.67	1.06	1.20	1.14	1.23	1.08
time (sec)	N/A	0.108	0.081	0.258	0.616	0.409	8.054	0.289	3.722

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	109	569	143	152	206	158	118
normalized size	1	1.00	1.21	6.32	1.59	1.69	2.29	1.76	1.31
time (sec)	N/A	0.082	0.055	0.178	0.668	0.424	2.990	0.322	3.711

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	133	113	571	143	155	219	158	120
normalized size	1	0.94	0.80	4.02	1.01	1.09	1.54	1.11	0.85
time (sec)	N/A	0.098	0.054	0.185	0.533	0.487	4.654	0.364	3.584

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	100	113	571	143	155	231	158	121
normalized size	1	0.75	0.85	4.29	1.08	1.17	1.74	1.19	0.91
time (sec)	N/A	0.096	0.055	0.184	0.613	0.483	7.116	0.309	3.739

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	100	113	571	143	155	224	158	121
normalized size	1	0.75	0.85	4.29	1.08	1.17	1.68	1.19	0.91
time (sec)	N/A	0.106	0.057	0.184	0.566	0.470	10.561	0.459	3.593

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	142	693	0	0	248	0	-1
normalized size	1	1.00	0.96	4.68	0.00	0.00	1.68	0.00	-0.01
time (sec)	N/A	0.177	0.081	0.230	0.000	0.490	38.895	0.000	0.000

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	105	521	0	0	199	0	-1
normalized size	1	1.00	0.98	4.87	0.00	0.00	1.86	0.00	-0.01
time (sec)	N/A	0.136	0.050	0.208	0.000	0.497	32.811	0.000	0.000

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	66	343	0	0	144	0	-1
normalized size	1	1.00	0.96	4.97	0.00	0.00	2.09	0.00	-0.01
time (sec)	N/A	0.094	0.033	0.232	0.000	0.487	13.683	0.000	0.000

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	37	195	0	0	0	0	-1
normalized size	1	1.00	0.95	5.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.026	0.007	0.206	0.000	0.483	0.000	0.000	0.000

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	66	63	336	0	0	158	0	-1
normalized size	1	1.50	1.43	7.64	0.00	0.00	3.59	0.00	-0.02
time (sec)	N/A	0.091	0.035	0.180	0.000	0.517	14.873	0.000	0.000

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	95	88	504	0	0	197	0	-1
normalized size	1	1.28	1.19	6.81	0.00	0.00	2.66	0.00	-0.01
time (sec)	N/A	0.145	0.089	0.188	0.000	0.535	61.192	0.000	0.000

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	135	124	689	0	0	246	0	-1
normalized size	1	1.23	1.13	6.26	0.00	0.00	2.24	0.00	-0.01
time (sec)	N/A	0.171	0.209	0.193	0.000	0.512	77.202	0.000	0.000

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	173	159	868	0	0	296	0	-1
normalized size	1	1.15	1.06	5.79	0.00	0.00	1.97	0.00	-0.01
time (sec)	N/A	0.212	0.208	0.195	0.000	0.523	91.862	0.000	0.000

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	151	141	739	0	0	304	0	-1
normalized size	1	0.99	0.93	4.86	0.00	0.00	2.00	0.00	-0.01
time (sec)	N/A	0.181	0.141	0.210	0.000	0.506	58.730	0.000	0.000

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	106	98	558	0	0	250	0	-1
normalized size	1	1.08	1.00	5.69	0.00	0.00	2.55	0.00	-0.01
time (sec)	N/A	0.143	0.091	0.203	0.000	0.465	30.047	0.000	0.000

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	74	71	389	0	0	0	0	-1
normalized size	1	1.14	1.09	5.98	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.108	0.062	0.179	0.000	0.470	0.000	0.000	0.000

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	41	173	63	51	187	58	54
normalized size	1	1.00	1.05	4.44	1.62	1.31	4.79	1.49	1.38
time (sec)	N/A	0.019	0.030	0.198	0.535	0.472	2.349	0.293	4.557

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	102	96	521	0	0	0	0	-1
normalized size	1	1.28	1.20	6.51	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.160	0.078	0.191	0.000	0.469	0.000	0.000	0.000

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	134	120	703	0	0	299	0	-1
normalized size	1	1.18	1.05	6.17	0.00	0.00	2.62	0.00	-0.01
time (sec)	N/A	0.179	0.140	0.197	0.000	0.473	65.880	0.000	0.000

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	178	165	910	0	0	357	0	-1
normalized size	1	1.16	1.07	5.91	0.00	0.00	2.32	0.00	-0.01
time (sec)	N/A	0.213	0.219	0.205	0.000	0.548	124.815	0.000	0.000

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	167	150	764	0	0	372	0	-1
normalized size	1	1.12	1.01	5.13	0.00	0.00	2.50	0.00	-0.01
time (sec)	N/A	0.216	0.140	0.210	0.000	0.562	48.374	0.000	0.000

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	132	122	596	0	0	328	0	-1
normalized size	1	1.23	1.14	5.57	0.00	0.00	3.07	0.00	-0.01
time (sec)	N/A	0.183	0.116	0.180	0.000	0.555	45.234	0.000	0.000

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	75	349	114	115	456	122	108
normalized size	1	1.00	1.21	5.63	1.84	1.85	7.35	1.97	1.74
time (sec)	N/A	0.050	0.120	0.217	0.605	0.576	6.044	0.390	4.029

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	53	235	99	107	515	120	91
normalized size	1	1.00	0.70	3.09	1.30	1.41	6.78	1.58	1.20
time (sec)	N/A	0.034	0.058	0.198	0.561	0.593	6.632	0.304	4.055

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	156	141	703	0	0	335	0	-1
normalized size	1	1.16	1.05	5.25	0.00	0.00	2.50	0.00	-0.01
time (sec)	N/A	0.250	0.131	0.197	0.000	0.771	98.139	0.000	0.000

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	193	173	894	0	0	425	0	-1
normalized size	1	1.13	1.01	5.23	0.00	0.00	2.49	0.00	-0.01
time (sec)	N/A	0.248	0.177	0.204	0.000	0.764	104.143	0.000	0.000

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	239	227	1119	0	0	478	0	-1
normalized size	1	1.10	1.05	5.16	0.00	0.00	2.20	0.00	-0.00
time (sec)	N/A	0.274	0.432	0.217	0.000	0.668	110.201	0.000	0.000

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	229	260	249	1153	0	0	598	0	-1
normalized size	1	1.14	1.09	5.03	0.00	0.00	2.61	0.00	-0.00
time (sec)	N/A	0.320	0.311	0.228	0.000	0.578	133.883	0.000	0.000

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	211	207	969	0	0	544	0	-1
normalized size	1	1.15	1.13	5.30	0.00	0.00	2.97	0.00	-0.01
time (sec)	N/A	0.281	0.227	0.220	0.000	0.717	71.889	0.000	0.000

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	178	179	801	0	0	500	0	-1
normalized size	1	1.26	1.27	5.68	0.00	0.00	3.55	0.00	-0.01
time (sec)	N/A	0.254	0.238	0.190	0.000	0.763	70.469	0.000	0.000

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	172	553	179	178	748	193	167
normalized size	1	1.00	2.18	7.00	2.27	2.25	9.47	2.44	2.11
time (sec)	N/A	0.071	0.120	0.234	0.665	0.699	15.670	0.296	4.021

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	135	403	150	162	796	176	141
normalized size	1	1.00	1.15	3.44	1.28	1.38	6.80	1.50	1.21
time (sec)	N/A	0.087	0.098	0.242	0.661	0.642	15.687	0.292	3.859

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	66	284	144	160	882	179	127
normalized size	1	1.00	0.69	2.99	1.52	1.68	9.28	1.88	1.34
time (sec)	N/A	0.041	0.086	0.205	0.576	0.768	16.080	0.299	3.853

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	174	196	222	884	0	0	493	0	-1
normalized size	1	1.13	1.28	5.08	0.00	0.00	2.83	0.00	-0.01
time (sec)	N/A	0.357	0.182	0.203	0.000	0.769	147.344	0.000	0.000

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	231	231	1083	0	0	595	0	-1
normalized size	1	1.09	1.09	5.13	0.00	0.00	2.82	0.00	-0.00
time (sec)	N/A	0.300	0.276	0.207	0.000	0.589	141.375	0.000	0.000

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	263	285	276	1324	0	0	649	0	-1
normalized size	1	1.08	1.05	5.03	0.00	0.00	2.47	0.00	-0.00
time (sec)	N/A	0.346	0.381	0.214	0.000	0.709	148.347	0.000	0.000

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	329	394	403	1768	0	0	0	0	-1
normalized size	1	1.20	1.22	5.37	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.639	0.467	0.242	0.000	0.867	0.000	0.000	0.000

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	285	351	356	1584	0	0	0	0	-1
normalized size	1	1.23	1.25	5.56	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.571	0.517	0.237	0.000	0.638	0.000	0.000	0.000

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	243	316	333	1416	0	0	0	0	-1
normalized size	1	1.30	1.37	5.83	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.538	0.457	0.202	0.000	0.770	0.000	0.000	0.000

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	335	1165	377	361	0	388	341
normalized size	1	1.00	2.46	8.57	2.77	2.65	0.00	2.85	2.51
time (sec)	N/A	0.110	0.294	0.285	0.656	0.785	0.000	0.307	4.479

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	316	1022	358	356	0	382	320
normalized size	1	1.00	1.94	6.27	2.20	2.18	0.00	2.34	1.96
time (sec)	N/A	0.129	0.322	0.270	0.759	0.774	0.000	0.345	4.259

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	226	226	281	867	338	343	0	372	296
normalized size	1	1.00	1.24	3.84	1.50	1.52	0.00	1.65	1.31
time (sec)	N/A	0.204	0.236	0.288	0.868	0.542	0.000	0.360	4.230

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	199	199	192	712	316	333	0	362	275
normalized size	1	1.00	0.96	3.58	1.59	1.67	0.00	1.82	1.38
time (sec)	N/A	0.165	0.215	0.273	0.675	0.764	0.000	0.338	3.931

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	174	174	160	557	294	323	0	352	251
normalized size	1	1.00	0.92	3.20	1.69	1.86	0.00	2.02	1.44
time (sec)	N/A	0.118	0.148	0.250	0.597	0.805	0.000	0.337	4.043

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	99	431	276	310	0	344	232
normalized size	1	1.00	0.65	2.84	1.82	2.04	0.00	2.26	1.53
time (sec)	N/A	0.065	0.146	0.211	0.892	0.846	0.000	0.306	3.929

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	294	316	349	1427	0	0	0	0	-1
normalized size	1	1.07	1.19	4.85	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.726	0.372	0.217	0.000	0.823	0.000	0.000	0.000

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	339	361	401	1650	0	0	0	0	-1
normalized size	1	1.06	1.18	4.87	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.581	0.613	0.230	0.000	0.735	0.000	0.000	0.000

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	401	423	486	1939	0	0	0	0	-1
normalized size	1	1.05	1.21	4.84	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.637	0.627	0.232	0.000	0.881	0.000	0.000	0.000

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	9	48	11	0	0	8
normalized size	1	1.00	1.00	0.75	4.00	0.92	0.00	0.00	0.67
time (sec)	N/A	0.011	0.003	0.036	0.540	0.839	0.000	0.000	3.462

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	11	7	45	9	0	0	6
normalized size	1	1.00	1.10	0.70	4.50	0.90	0.00	0.00	0.60
time (sec)	N/A	0.011	0.002	0.033	0.571	0.597	0.000	0.000	3.503

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	82	1622	151	219	309	251	116
normalized size	1	1.00	0.75	14.88	1.39	2.01	2.83	2.30	1.06
time (sec)	N/A	0.143	0.060	0.284	0.595	0.706	2.748	0.389	3.583

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	82	1621	150	219	304	248	116
normalized size	1	1.00	0.75	14.87	1.38	2.01	2.79	2.28	1.06
time (sec)	N/A	0.112	0.056	0.270	0.559	0.688	1.799	0.258	3.531

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	77	1548	136	200	270	225	104
normalized size	1	1.00	0.76	15.33	1.35	1.98	2.67	2.23	1.03
time (sec)	N/A	0.072	0.049	0.277	0.594	0.449	1.102	0.348	3.678

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	59	1555	101	144	204	169	85
normalized size	1	1.00	0.84	22.21	1.44	2.06	2.91	2.41	1.21
time (sec)	N/A	0.083	0.022	0.450	0.730	0.443	1.048	0.347	3.432

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	63	1544	114	149	182	172	138
normalized size	1	1.00	0.88	21.44	1.58	2.07	2.53	2.39	1.92
time (sec)	N/A	0.117	0.038	0.429	0.833	0.431	6.634	0.305	3.733

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	90	1483	150	179	272	205	109
normalized size	1	1.00	0.87	14.40	1.46	1.74	2.64	1.99	1.06
time (sec)	N/A	0.134	0.048	0.242	0.567	0.833	1.284	0.290	3.537

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	82	1486	151	187	306	206	114
normalized size	1	1.00	0.75	13.63	1.39	1.72	2.81	1.89	1.05
time (sec)	N/A	0.133	0.060	0.249	0.611	0.561	2.028	0.337	3.794

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	82	1486	151	188	311	206	114
normalized size	1	1.00	0.75	13.63	1.39	1.72	2.85	1.89	1.05
time (sec)	N/A	0.135	0.057	0.259	0.742	0.667	3.068	0.306	3.508

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	149	2597	250	364	517	408	180
normalized size	1	1.00	0.84	14.59	1.40	2.04	2.90	2.29	1.01
time (sec)	N/A	0.218	0.100	0.316	0.597	0.429	4.825	0.383	3.742

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	134	2597	250	363	510	408	179
normalized size	1	1.00	0.75	14.59	1.40	2.04	2.87	2.29	1.01
time (sec)	N/A	0.181	0.095	0.319	0.523	0.475	3.269	0.324	3.620

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	173	141	135	2565	235	347	478	385	166
normalized size	1	0.82	0.78	14.83	1.36	2.01	2.76	2.23	0.96
time (sec)	N/A	0.127	0.084	0.418	0.588	0.782	2.185	0.363	3.495

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	114	2543	198	293	398	321	152
normalized size	1	1.00	0.83	18.56	1.45	2.14	2.91	2.34	1.11
time (sec)	N/A	0.231	0.040	0.512	0.592	0.702	2.107	0.343	3.775

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	107	2521	200	291	384	329	228
normalized size	1	1.00	0.80	18.95	1.50	2.19	2.89	2.47	1.71
time (sec)	N/A	0.172	0.043	0.559	0.630	0.608	2.063	0.405	3.744

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	117	2520	210	291	357	325	221
normalized size	1	1.00	0.85	18.39	1.53	2.12	2.61	2.37	1.61
time (sec)	N/A	0.192	0.085	0.512	0.690	0.605	9.290	0.443	3.767

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	168	168	131	2473	250	326	479	366	184
normalized size	1	1.00	0.78	14.72	1.49	1.94	2.85	2.18	1.10
time (sec)	N/A	0.208	0.096	0.305	0.739	0.814	2.406	0.443	3.896

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	134	2475	251	332	512	366	188
normalized size	1	1.00	0.75	13.90	1.41	1.87	2.88	2.06	1.06
time (sec)	N/A	0.205	0.098	0.327	0.803	0.590	3.495	0.363	3.670

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	271	271	211	0	0	0	0	0	-1
normalized size	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.276	0.173	0.722	0.000	0.483	0.000	0.000	0.000

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	158	0	0	0	0	0	-1
normalized size	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.217	0.105	0.713	0.000	0.673	0.000	0.000	0.000

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	103	0	0	0	0	0	-1
normalized size	1	1.00	0.79	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.155	0.068	0.677	0.000	0.600	0.000	0.000	0.000

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	68	1412	0	0	0	0	-1
normalized size	1	1.00	0.94	19.61	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.061	0.026	0.358	0.000	0.558	0.000	0.000	0.000

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	98	94	2315	0	0	0	0	-1
normalized size	1	1.24	1.19	29.30	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.157	0.066	0.474	0.000	0.503	0.000	0.000	0.000

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	155	130	0	0	0	0	0	-1
normalized size	1	1.15	0.96	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.242	0.123	0.711	0.000	0.492	0.000	0.000	0.000

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	226	185	0	0	0	0	0	-1
normalized size	1	1.11	0.91	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.292	0.139	0.749	0.000	0.804	0.000	0.000	0.000

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	273	295	237	0	0	0	0	0	-1
normalized size	1	1.08	0.87	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.357	0.137	0.768	0.000	0.490	0.000	0.000	0.000

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	281	281	240	0	0	0	0	0	-1
normalized size	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.310	0.205	0.693	0.000	0.667	0.000	0.000	0.000

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	186	0	0	0	0	0	-1
normalized size	1	1.00	0.92	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.261	0.162	0.776	0.000	0.536	0.000	0.000	0.000

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	143	143	142	0	0	0	0	0	-1
normalized size	1	1.00	0.99	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.202	0.125	0.730	0.000	0.565	0.000	0.000	0.000

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	81	755	0	0	0	0	-1
normalized size	1	1.00	1.05	9.81	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.058	0.048	0.266	0.000	0.549	0.000	0.000	0.000

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	170	166	0	0	0	0	0	-1
normalized size	1	1.13	1.10	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.308	0.167	0.763	0.000	0.546	0.000	0.000	0.000

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	231	223	0	0	0	0	0	-1
normalized size	1	1.09	1.06	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.315	0.318	0.726	0.000	0.573	0.000	0.000	0.000

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	285	304	268	0	0	0	0	0	-1
normalized size	1	1.07	0.94	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.377	0.190	0.764	0.000	0.558	0.000	0.000	0.000

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	296	296	258	0	0	0	0	0	-1
normalized size	1	1.00	0.87	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.490	0.269	0.747	0.000	0.624	0.000	0.000	0.000

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	212	0	0	0	0	0	-1
normalized size	1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.446	0.280	0.773	0.000	0.471	0.000	0.000	0.000

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	112	176	155	1199	0	0	0	0	-1
normalized size	1	1.57	1.38	10.71	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.357	0.236	0.315	0.000	0.660	0.000	0.000	0.000

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	145	146	990	0	0	0	0	-1
normalized size	1	1.15	1.16	7.86	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.201	0.103	0.276	0.000	0.528	0.000	0.000	0.000

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	257	257	232	0	0	0	0	0	-1
normalized size	1	1.00	0.90	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.594	0.256	0.829	0.000	0.581	0.000	0.000	0.000

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	322	322	290	0	0	0	0	0	-1
normalized size	1	1.00	0.90	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.538	0.414	0.770	0.000	0.506	0.000	0.000	0.000

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	398	398	344	0	0	0	0	0	-1
normalized size	1	1.00	0.86	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.826	0.654	0.886	0.000	0.523	0.000	0.000	0.000

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	333	333	298	0	0	0	0	0	-1
normalized size	1	1.00	0.89	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.786	0.498	0.858	0.000	0.593	0.000	0.000	0.000

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	161	274	371	1658	0	0	0	0	-1
normalized size	1	1.70	2.30	10.30	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.716	0.513	0.312	0.000	0.474	0.000	0.000	0.000

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	210	229	281	1400	0	0	0	0	-1
normalized size	1	1.09	1.34	6.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.620	0.246	0.297	0.000	0.484	0.000	0.000	0.000

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	221	211	1227	0	0	0	0	-1
normalized size	1	1.09	1.04	6.04	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.312	0.156	0.276	0.000	0.476	0.000	0.000	0.000

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	351	351	318	0	0	0	0	0	-1
normalized size	1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.012	0.432	0.919	0.000	0.476	0.000	0.000	0.000

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	420	420	378	0	0	0	0	0	-1
normalized size	1	1.00	0.90	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.893	0.670	0.861	0.000	0.472	0.000	0.000	0.000

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	157	96	0	132	0	357	0	-1
normalized size	1	1.47	0.90	0.00	1.23	0.00	3.34	0.00	-0.01
time (sec)	N/A	0.407	0.144	0.230	0.715	0.541	55.500	0.000	0.000

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	130	243	9909	0	0	0	0	-1
normalized size	1	1.15	2.15	87.69	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.208	0.197	0.870	0.000	0.485	0.000	0.000	0.000

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	234	432	0	0	0	0	0	-1
normalized size	1	1.08	1.99	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.396	0.498	1.053	0.000	0.670	0.000	0.000	0.000

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	361	361	706	0	0	0	0	0	-1
normalized size	1	1.00	1.96	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.852	0.921	1.291	0.000	0.548	0.000	0.000	0.000

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	169	0	0	0	0	0	-1
normalized size	1	1.00	0.89	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.266	0.281	0.295	0.000	0.000	0.000	0.000	0.000

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	298	298	287	0	0	0	0	0	-1
normalized size	1	1.00	0.96	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.467	0.398	0.408	0.000	0.000	0.000	0.000	0.000

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	402	402	366	0	0	0	0	0	-1
normalized size	1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.615	0.509	0.397	0.000	0.000	0.000	0.000	0.000

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.048	6.362	0.447	0.000	0.000	0.000	0.000	0.000

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.101	6.800	0.414	0.000	0.000	0.000	0.000	0.000

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	66	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.198	13.347	0.426	0.000	0.000	0.000	0.000	0.000

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	183	0	227	495	518	0	-1
normalized size	1	1.00	0.76	0.00	0.94	2.05	2.14	0.00	-0.00
time (sec)	N/A	0.220	0.465	0.490	1.374	0.735	16.486	0.000	0.000

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	151	0	184	396	364	0	-1
normalized size	1	1.00	0.79	0.00	0.96	2.06	1.90	0.00	-0.01
time (sec)	N/A	0.176	0.218	0.474	1.359	0.720	11.157	0.000	0.000

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	116	0	143	291	224	0	-1
normalized size	1	1.00	0.82	0.00	1.01	2.05	1.58	0.00	-0.01
time (sec)	N/A	0.101	0.126	0.462	1.578	0.551	6.856	0.000	0.000

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	77	0	93	184	102	0	-1
normalized size	1	1.00	0.82	0.00	0.99	1.96	1.09	0.00	-0.01
time (sec)	N/A	0.042	0.072	0.461	1.402	0.584	3.792	0.000	0.000

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	331	0	0	0	0	0	-1
normalized size	1	1.00	1.57	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.331	0.218	0.385	0.000	0.609	0.000	0.000	0.000

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	221	221	392	0	0	0	0	0	-1
normalized size	1	1.00	1.77	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.278	0.335	0.400	0.000	0.639	0.000	0.000	0.000

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	298	298	500	0	0	0	0	0	-1
normalized size	1	1.00	1.68	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.339	0.546	0.391	0.000	0.535	0.000	0.000	0.000

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	263	263	187	0	239	595	1188	0	-1
normalized size	1	1.00	0.71	0.00	0.91	2.26	4.52	0.00	-0.00
time (sec)	N/A	0.240	0.341	0.470	1.330	0.700	148.736	0.000	0.000

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	213	213	153	0	196	496	870	0	-1
normalized size	1	1.00	0.72	0.00	0.92	2.33	4.08	0.00	-0.00
time (sec)	N/A	0.197	0.238	0.452	1.532	0.799	105.830	0.000	0.000

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	120	0	155	391	583	0	-1
normalized size	1	1.00	0.74	0.00	0.95	2.40	3.58	0.00	-0.01
time (sec)	N/A	0.117	0.178	0.450	1.246	0.445	69.886	0.000	0.000

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	87	0	105	288	333	0	-1
normalized size	1	1.00	0.76	0.00	0.91	2.50	2.90	0.00	-0.01
time (sec)	N/A	0.051	0.106	0.430	1.324	0.439	38.358	0.000	0.000

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	375	0	0	0	0	0	-1
normalized size	1	1.00	1.47	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.456	0.302	0.364	0.000	0.417	0.000	0.000	0.000

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	259	259	480	0	0	0	0	0	-1
normalized size	1	1.00	1.85	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.324	0.341	0.354	0.000	0.425	0.000	0.000	0.000

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	293	293	501	0	0	0	0	0	-1
normalized size	1	1.00	1.71	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.384	0.603	0.379	0.000	0.459	0.000	0.000	0.000

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	150	0	215	395	0	275	-1
normalized size	1	1.00	0.69	0.00	0.99	1.82	0.00	1.27	-0.00
time (sec)	N/A	0.204	0.232	0.429	1.449	0.481	0.000	0.835	0.000

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	169	169	118	0	172	296	0	210	-1
normalized size	1	1.00	0.70	0.00	1.02	1.75	0.00	1.24	-0.01
time (sec)	N/A	0.169	0.180	0.433	1.329	0.453	0.000	0.935	0.000

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	80	0	127	189	0	145	-1
normalized size	1	1.00	0.67	0.00	1.07	1.59	0.00	1.22	-0.01
time (sec)	N/A	0.091	0.111	0.423	1.231	0.462	0.000	0.755	0.000

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	55	70	82	116	252	78	-1
normalized size	1	1.00	0.80	1.01	1.19	1.68	3.65	1.13	-0.01
time (sec)	N/A	0.034	0.043	0.041	1.352	0.496	27.884	0.339	0.000

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	249	0	0	0	0	0	-1
normalized size	1	1.00	1.64	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.199	0.099	0.388	0.000	0.463	0.000	0.000	0.000

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	226	226	392	0	0	0	0	0	-1
normalized size	1	1.00	1.73	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.270	0.261	0.365	0.000	0.459	0.000	0.000	0.000

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	304	304	501	0	0	0	0	0	-1
normalized size	1	1.00	1.65	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.336	0.426	0.366	0.000	0.451	0.000	0.000	0.000

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	194	194	159	0	200	435	384	0	-1
normalized size	1	1.00	0.82	0.00	1.03	2.24	1.98	0.00	-0.01
time (sec)	N/A	0.195	0.131	0.370	1.255	0.503	56.705	0.000	0.000

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	124	0	157	330	262	0	-1
normalized size	1	1.00	0.85	0.00	1.08	2.26	1.79	0.00	-0.01
time (sec)	N/A	0.162	0.097	0.364	1.446	0.584	39.945	0.000	0.000

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	83	0	112	223	153	105	-1
normalized size	1	1.00	0.88	0.00	1.19	2.37	1.63	1.12	-0.01
time (sec)	N/A	0.087	0.071	0.371	1.425	0.613	58.816	0.344	0.000

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	53	0	71	155	66	57	-1
normalized size	1	1.00	1.00	0.00	1.34	2.92	1.25	1.08	-0.02
time (sec)	N/A	0.032	0.043	0.339	1.559	0.644	13.888	0.338	0.000

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	201	201	295	0	0	0	0	0	-1
normalized size	1	1.00	1.47	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.320	0.279	0.370	0.000	0.499	0.000	0.000	0.000

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	253	255	506	0	0	0	0	0	-1
normalized size	1	1.01	2.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.517	0.493	0.371	0.000	0.502	0.000	0.000	0.000

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.086	1.345	0.507	0.000	0.500	0.000	0.000	0.000

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.061	0.761	0.509	0.000	0.507	0.000	0.000	0.000

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.030	0.022	0.502	0.000	0.689	0.000	0.000	0.000

Problem 160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.082	0.273	0.508	0.000	0.460	0.000	0.000	0.000

Problem 161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.089	0.641	0.536	0.000	0.772	0.000	0.000	0.000

Problem 162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	152	5021	271	1222	8381	531	-1
normalized size	1	1.00	0.72	23.80	1.28	5.79	39.72	2.52	-0.00
time (sec)	N/A	0.228	0.236	0.689	0.877	0.581	40.640	0.499	0.000

Problem 163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	108	2702	195	633	3815	374	-1
normalized size	1	1.00	0.71	17.66	1.27	4.14	24.93	2.44	-0.01
time (sec)	N/A	0.173	0.145	0.382	0.868	0.463	20.290	0.547	0.000

Problem 164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	64	1122	119	235	1238	217	-1
normalized size	1	1.00	0.67	11.81	1.25	2.47	13.03	2.28	-0.01
time (sec)	N/A	0.081	0.071	0.240	0.643	0.726	10.294	0.367	0.000

Problem 165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	32	371	57	52	192	95	-1
normalized size	1	1.00	0.70	8.07	1.24	1.13	4.17	2.07	-0.02
time (sec)	N/A	0.017	0.013	0.156	0.673	0.515	10.176	0.360	0.000

Problem 166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	72	0	0	0	0	0	-1
normalized size	1	0.00	2.77	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.055	0.105	0.623	0.000	0.528	0.000	0.000	0.000

Problem 167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	72	0	0	0	0	0	-1
normalized size	1	0.00	2.77	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.053	0.107	0.655	0.000	0.525	0.000	0.000	0.000

Problem 168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	173	0	0	0	0	0	-1
normalized size	1	0.00	9.61	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.019	0.251	0.651	0.000	0.524	0.000	0.000	0.000

Problem 169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	61	0	0	0	233	0	-1
normalized size	1	1.00	0.90	0.00	0.00	0.00	3.43	0.00	-0.01
time (sec)	N/A	0.028	0.022	0.541	0.000	0.634	27.793	0.000	0.000

Problem 170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	89	0	0	0	0	0	-1
normalized size	1	0.00	4.45	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.029	0.064	0.558	0.000	0.595	0.000	0.000	0.000

Problem 171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	69	266	57	69	87	73	51
normalized size	1	1.00	1.44	5.54	1.19	1.44	1.81	1.52	1.06
time (sec)	N/A	0.043	0.003	0.214	0.468	0.777	9.202	0.357	3.417

Problem 172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	69	266	57	69	87	73	51
normalized size	1	1.00	1.44	5.54	1.19	1.44	1.81	1.52	1.06
time (sec)	N/A	0.042	0.002	0.207	0.460	0.427	3.667	0.267	3.395

Problem 173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	69	265	57	67	87	73	51
normalized size	1	1.00	1.47	5.64	1.21	1.43	1.85	1.55	1.09
time (sec)	N/A	0.037	0.002	0.225	0.469	0.510	1.442	0.360	3.386

Problem 174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	57	257	49	55	71	60	48
normalized size	1	1.00	1.10	4.94	0.94	1.06	1.37	1.15	0.92
time (sec)	N/A	0.064	0.003	0.272	0.608	0.545	0.910	0.320	3.342

Problem 175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	47	57	266	49	59	63	63	66
normalized size	1	0.90	1.10	5.12	0.94	1.13	1.21	1.21	1.27
time (sec)	N/A	0.049	0.004	0.232	0.554	0.491	4.574	0.315	3.402

Problem 176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	47	69	248	57	60	88	65	51
normalized size	1	0.82	1.21	4.35	1.00	1.05	1.54	1.14	0.89
time (sec)	N/A	0.047	0.003	0.155	0.468	0.443	2.568	0.278	3.383

Problem 177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	69	266	57	69	87	73	51
normalized size	1	1.00	1.44	5.54	1.19	1.44	1.81	1.52	1.06
time (sec)	N/A	0.043	0.003	0.201	0.466	0.526	5.844	0.378	3.345

Problem 178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	69	266	57	69	87	73	51
normalized size	1	1.00	1.44	5.54	1.19	1.44	1.81	1.52	1.06
time (sec)	N/A	0.042	0.003	0.209	0.462	0.518	2.309	0.365	3.315

Problem 179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	41	55	247	49	61	73	62	43
normalized size	1	0.85	1.15	5.15	1.02	1.27	1.52	1.29	0.90
time (sec)	N/A	0.018	0.002	0.208	0.478	0.526	0.857	0.243	3.315

Problem 180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	37	49	249	49	58	60	62	51
normalized size	1	0.84	1.11	5.66	1.11	1.32	1.36	1.41	1.16
time (sec)	N/A	0.039	0.002	0.217	0.473	0.431	0.894	0.355	3.340

Problem 181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	45	63	249	57	59	75	65	51
normalized size	1	0.85	1.19	4.70	1.08	1.11	1.42	1.23	0.96
time (sec)	N/A	0.047	0.003	0.151	0.466	0.467	1.642	0.270	3.630

Problem 182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	48	69	251	57	63	88	66	53
normalized size	1	0.84	1.21	4.40	1.00	1.11	1.54	1.16	0.93
time (sec)	N/A	0.046	0.003	0.155	0.475	0.453	3.913	0.280	3.609

Problem 183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	84	434	100	118	151	123	82
normalized size	1	1.00	1.14	5.86	1.35	1.59	2.04	1.66	1.11
time (sec)	N/A	0.087	0.043	0.211	0.479	0.579	21.661	0.242	3.703

Problem 184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	87	434	100	118	151	123	82
normalized size	1	1.00	1.18	5.86	1.35	1.59	2.04	1.66	1.11
time (sec)	N/A	0.088	0.059	0.213	0.528	0.462	9.636	0.331	3.646

Problem 185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	85	433	100	116	151	123	82
normalized size	1	1.00	1.12	5.70	1.32	1.53	1.99	1.62	1.08
time (sec)	N/A	0.068	0.048	0.223	0.460	0.530	3.913	0.331	3.633

Problem 186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	73	82	423	88	104	129	105	80
normalized size	1	0.82	0.92	4.75	0.99	1.17	1.45	1.18	0.90
time (sec)	N/A	0.082	0.082	0.297	0.470	0.471	2.610	0.301	3.664

Problem 187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	71	83	433	91	108	136	112	110
normalized size	1	0.78	0.91	4.76	1.00	1.19	1.49	1.23	1.21
time (sec)	N/A	0.099	0.061	0.319	0.485	0.467	2.755	0.261	3.745

Problem 188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	73	82	434	90	108	105	113	102
normalized size	1	0.81	0.91	4.82	1.00	1.20	1.17	1.26	1.13
time (sec)	N/A	0.089	0.057	0.247	0.517	0.590	6.166	0.312	3.574

Problem 189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	95	434	100	118	158	123	82
normalized size	1	1.00	1.28	5.86	1.35	1.59	2.14	1.66	1.11
time (sec)	N/A	0.072	0.036	0.217	0.480	0.580	14.499	0.386	3.695

Problem 190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	95	434	100	118	158	123	82
normalized size	1	1.00	1.28	5.86	1.35	1.59	2.14	1.66	1.11
time (sec)	N/A	0.071	0.035	0.217	0.509	0.636	6.175	0.277	3.591

Problem 191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	68	89	416	92	112	144	112	74
normalized size	1	0.79	1.03	4.84	1.07	1.30	1.67	1.30	0.86
time (sec)	N/A	0.035	0.035	0.219	0.469	0.445	2.535	0.407	3.444

Problem 192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	66	86	419	94	109	131	116	102
normalized size	1	0.80	1.04	5.05	1.13	1.31	1.58	1.40	1.23
time (sec)	N/A	0.071	0.035	0.208	0.493	0.478	2.624	0.306	3.456

Problem 193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	65	80	417	92	110	131	116	90
normalized size	1	0.79	0.98	5.09	1.12	1.34	1.60	1.41	1.10
time (sec)	N/A	0.073	0.040	0.233	0.466	0.630	2.764	0.281	3.482

Problem 194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	72	86	419	100	111	146	116	88
normalized size	1	0.79	0.95	4.60	1.10	1.22	1.60	1.27	0.97
time (sec)	N/A	0.083	0.042	0.167	0.468	0.898	4.211	0.263	3.511

Problem 195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	74	95	419	100	112	160	116	89
normalized size	1	0.78	1.00	4.41	1.05	1.18	1.68	1.22	0.94
time (sec)	N/A	0.083	0.046	0.172	0.462	0.550	10.080	0.286	3.549

Problem 196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	120	602	143	167	230	173	113
normalized size	1	1.00	1.20	6.02	1.43	1.67	2.30	1.73	1.13
time (sec)	N/A	0.106	0.055	0.217	0.478	0.534	47.088	0.296	3.515

Problem 197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	120	602	143	167	223	173	113
normalized size	1	1.00	0.92	4.63	1.10	1.28	1.72	1.33	0.87
time (sec)	N/A	0.152	0.054	0.217	0.539	0.621	22.603	0.325	3.482

Problem 198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	118	601	143	165	223	173	113
normalized size	1	1.00	1.30	6.60	1.57	1.81	2.45	1.90	1.24
time (sec)	N/A	0.075	0.051	0.243	0.489	0.672	9.986	0.283	3.491

Problem 199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	100	116	595	133	155	212	158	112
normalized size	1	0.77	0.89	4.58	1.02	1.19	1.63	1.22	0.86
time (sec)	N/A	0.104	0.065	0.301	0.486	0.767	6.659	0.274	3.666

Problem 200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	100	115	604	133	155	209	160	163
normalized size	1	0.76	0.88	4.61	1.02	1.18	1.60	1.22	1.24
time (sec)	N/A	0.125	0.087	0.326	0.490	0.861	6.849	0.418	3.641

Problem 201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	99	115	602	133	157	209	162	149
normalized size	1	0.76	0.88	4.60	1.02	1.20	1.60	1.24	1.14
time (sec)	N/A	0.123	0.085	0.332	0.500	0.816	6.919	0.290	3.664

Problem 202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	133	602	143	167	223	173	113
normalized size	1	1.00	1.33	6.02	1.43	1.67	2.23	1.73	1.13
time (sec)	N/A	0.088	0.050	0.216	0.490	0.655	32.867	0.307	3.726

Problem 203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	133	602	143	167	230	173	113
normalized size	1	1.00	1.33	6.02	1.43	1.67	2.30	1.73	1.13
time (sec)	N/A	0.087	0.047	0.217	0.538	0.873	15.398	0.319	3.625

Problem 204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	94	124	582	133	161	204	159	104
normalized size	1	0.78	1.02	4.81	1.10	1.33	1.69	1.31	0.86
time (sec)	N/A	0.048	0.045	0.217	0.459	0.721	6.603	0.315	3.717

Problem 205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	92	123	587	135	159	190	166	145
normalized size	1	0.78	1.04	4.97	1.14	1.35	1.61	1.41	1.23
time (sec)	N/A	0.082	0.057	0.244	0.517	0.596	6.772	0.418	3.515

Problem 206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	91	112	585	137	156	202	166	141
normalized size	1	0.75	0.93	4.83	1.13	1.29	1.67	1.37	1.17
time (sec)	N/A	0.091	0.055	0.247	0.500	0.469	6.919	0.258	3.531

Problem 207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	91	115	585	135	160	190	166	125
normalized size	1	0.77	0.97	4.96	1.14	1.36	1.61	1.41	1.06
time (sec)	N/A	0.086	0.056	0.257	0.645	0.655	6.972	0.387	3.584

Problem 208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	98	127	587	143	160	206	166	123
normalized size	1	0.77	1.00	4.62	1.13	1.26	1.62	1.31	0.97
time (sec)	N/A	0.101	0.061	0.178	0.681	0.622	10.392	0.273	3.795

Problem 209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	100	133	587	143	161	231	166	125
normalized size	1	0.75	1.00	4.41	1.08	1.21	1.74	1.25	0.94
time (sec)	N/A	0.098	0.061	0.185	0.631	0.494	23.036	0.288	3.699

Problem 210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	174	641	0	0	235	0	-1
normalized size	1	1.00	1.44	5.30	0.00	0.00	1.94	0.00	-0.01
time (sec)	N/A	0.173	0.123	0.220	0.000	0.770	90.776	0.000	0.000

Problem 211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	135	460	0	0	180	0	-1
normalized size	1	1.00	1.63	5.54	0.00	0.00	2.17	0.00	-0.01
time (sec)	N/A	0.143	0.073	0.212	0.000	0.626	34.149	0.000	0.000

Problem 212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	94	299	0	0	119	0	-1
normalized size	1	1.00	1.92	6.10	0.00	0.00	2.43	0.00	-0.02
time (sec)	N/A	0.048	0.034	0.178	0.000	0.631	7.825	0.000	0.000

Problem 213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	126	439	0	0	124	0	-1
normalized size	1	1.00	2.57	8.96	0.00	0.00	2.53	0.00	-0.02
time (sec)	N/A	0.065	0.101	0.192	0.000	0.614	16.736	0.000	0.000

Problem 214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	109	157	611	0	0	0	0	-1
normalized size	1	1.31	1.89	7.36	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.176	0.134	0.194	0.000	0.594	0.000	0.000	0.000

Problem 215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	149	196	805	0	0	0	0	-1
normalized size	1	1.23	1.62	6.65	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.214	0.200	0.206	0.000	0.692	0.000	0.000	0.000

Problem 216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	167	167	208	693	0	0	0	0	-1
normalized size	1	1.00	1.25	4.15	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.207	0.164	0.241	0.000	0.585	0.000	0.000	0.000

Problem 217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	170	512	0	0	0	0	-1
normalized size	1	1.00	1.29	3.88	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.165	0.110	0.237	0.000	0.483	0.000	0.000	0.000

Problem 218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	107	332	0	0	0	0	-1
normalized size	1	1.00	1.02	3.16	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.066	0.047	0.269	0.000	0.591	0.000	0.000	0.000

Problem 219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	173	531	0	0	0	0	-1
normalized size	1	1.00	1.29	3.96	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.175	0.142	0.292	0.000	0.681	0.000	0.000	0.000

Problem 220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	211	706	0	0	0	0	-1
normalized size	1	1.00	1.28	4.28	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.197	0.185	0.301	0.000	0.500	0.000	0.000	0.000

Problem 221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	287	687	0	0	294	0	-1
normalized size	1	1.00	2.22	5.33	0.00	0.00	2.28	0.00	-0.01
time (sec)	N/A	0.220	0.509	0.224	0.000	0.663	112.338	0.000	0.000

Problem 222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	321	511	0	0	0	0	-1
normalized size	1	1.00	3.38	5.38	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.188	0.243	0.192	0.000	0.574	0.000	0.000	0.000

Problem 223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	74	179	71	61	366	70	73
normalized size	1	1.00	1.48	3.58	1.42	1.22	7.32	1.40	1.46
time (sec)	N/A	0.042	0.066	0.197	0.479	0.736	59.946	0.246	3.498

Problem 224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	279	644	0	0	0	0	-1
normalized size	1	1.00	3.40	7.85	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.140	0.424	0.199	0.000	0.600	0.000	0.000	0.000

Problem 225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	159	334	817	0	0	0	0	-1
normalized size	1	1.26	2.65	6.48	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.289	0.569	0.202	0.000	0.549	0.000	0.000	0.000

Problem 226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	191	296	913	0	0	0	0	-1
normalized size	1	1.00	1.55	4.78	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.297	0.559	0.301	0.000	0.624	0.000	0.000	0.000

Problem 227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	258	752	0	0	0	0	-1
normalized size	1	1.00	1.57	4.59	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.269	0.493	0.336	0.000	0.536	0.000	0.000	0.000

Problem 228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	289	685	0	0	0	0	-1
normalized size	1	1.00	1.76	4.18	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.099	0.577	0.337	0.000	0.481	0.000	0.000	0.000

Problem 229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	328	933	0	0	0	0	-1
normalized size	1	1.00	1.79	5.10	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.284	0.730	0.369	0.000	0.600	0.000	0.000	0.000

Problem 230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	361	1133	0	0	0	0	-1
normalized size	1	1.00	1.61	5.06	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.309	0.711	0.342	0.000	0.553	0.000	0.000	0.000

Problem 231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	498	727	0	0	381	0	-1
normalized size	1	1.00	3.28	4.78	0.00	0.00	2.51	0.00	-0.01
time (sec)	N/A	0.287	0.601	0.207	0.000	0.568	163.085	0.000	0.000

Problem 232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	129	369	128	126	0	140	129
normalized size	1	1.00	1.90	5.43	1.88	1.85	0.00	2.06	1.90
time (sec)	N/A	0.080	0.151	0.244	0.508	0.755	0.000	0.301	3.736

Problem 233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	111	243	109	118	0	136	109
normalized size	1	1.00	1.35	2.96	1.33	1.44	0.00	1.66	1.33
time (sec)	N/A	0.066	0.071	0.207	0.525	0.674	0.000	0.292	3.679

Problem 234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	396	841	0	0	0	0	-1
normalized size	1	1.00	3.44	7.31	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.218	1.021	0.213	0.000	0.822	0.000	0.000	0.000

Problem 235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	195	507	1030	0	0	0	0	-1
normalized size	1	1.20	3.13	6.36	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.390	1.272	0.218	0.000	0.681	0.000	0.000	0.000

Problem 236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	495	1311	0	0	0	0	-1
normalized size	1	1.00	2.35	6.21	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.458	1.268	0.359	0.000	0.455	0.000	0.000	0.000

Problem 237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	187	187	497	1247	0	0	0	0	-1
normalized size	1	1.00	2.66	6.67	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.369	1.081	0.358	0.000	0.427	0.000	0.000	0.000

Problem 238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	210	210	544	1047	0	0	0	0	-1
normalized size	1	1.00	2.59	4.99	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.146	0.955	0.336	0.000	0.400	0.000	0.000	0.000

Problem 239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	219	219	552	1518	0	0	0	0	-1
normalized size	1	1.00	2.52	6.93	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.366	1.613	0.391	0.000	0.405	0.000	0.000	0.000

Problem 240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	260	260	584	1729	0	0	0	0	-1
normalized size	1	1.00	2.25	6.65	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.421	1.668	0.403	0.000	0.404	0.000	0.000	0.000

Problem 241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	C	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	12	76	14	78	0	11
normalized size	1	1.00	1.00	0.71	4.47	0.82	4.59	0.00	0.65
time (sec)	N/A	0.043	0.005	0.033	0.490	0.380	8.245	0.000	3.382

Problem 242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	17	52	58	13	102	0	10
normalized size	1	1.00	1.06	3.25	3.62	0.81	6.38	0.00	0.62
time (sec)	N/A	0.043	0.004	0.140	0.479	0.406	6.185	0.000	3.345

Problem 243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	31	20	48	0	0	0	18
normalized size	1	1.00	1.41	0.91	2.18	0.00	0.00	0.00	0.82
time (sec)	N/A	0.022	0.006	0.036	0.465	0.430	0.000	0.000	0.041

Problem 244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	65	46	26	0	0	0	24
normalized size	1	1.00	2.03	1.44	0.81	0.00	0.00	0.00	0.75
time (sec)	N/A	0.036	0.008	0.038	1.175	0.448	0.000	0.000	3.329

Problem 245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	68	103	0	0	0	0	-1
normalized size	1	1.00	1.10	1.66	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.039	0.031	0.065	0.000	0.434	0.000	0.000	0.000

Problem 246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	72	200	0	0	0	0	-1
normalized size	1	1.00	1.09	3.03	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.039	0.026	0.204	0.000	0.466	0.000	0.000	0.000

Problem 247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	509	509	432	0	0	0	0	0	-1
normalized size	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.612	0.784	27.054	0.000	0.454	0.000	0.000	0.000

Problem 248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	711	711	1073	0	0	0	0	0	-1
normalized size	1	1.00	1.51	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.846	2.462	31.293	0.000	0.429	0.000	0.000	0.000

Problem 249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.033	2.879	0.584	0.000	0.420	0.000	0.000	0.000

Problem 250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	14.493	3.522	0.000	0.426	0.000	0.000	0.000

Problem 251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	208	208	251	0	220	414	0	296	-1
normalized size	1	1.00	1.21	0.00	1.06	1.99	0.00	1.42	-0.00
time (sec)	N/A	0.250	0.205	0.417	1.026	0.518	0.000	0.749	0.000

Problem 252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	204	0	167	309	0	221	-1
normalized size	1	1.00	1.32	0.00	1.08	2.01	0.00	1.44	-0.01
time (sec)	N/A	0.175	0.156	0.409	1.032	0.482	0.000	0.528	0.000

Problem 253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	136	0	85	202	155	145	-1
normalized size	1	1.00	1.33	0.00	0.83	1.98	1.52	1.42	-0.01
time (sec)	N/A	0.088	0.111	0.395	0.479	0.495	23.110	0.512	0.000

Problem 254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	203	0	0	0	0	0	-1
normalized size	1	1.00	0.92	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.334	0.332	0.372	0.000	0.471	0.000	0.000	0.000

Problem 255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	252	303	0	0	0	0	0	-1
normalized size	1	1.00	1.20	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.376	0.558	0.375	0.000	0.432	0.000	0.000	0.000

Problem 256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	469	469	276	0	0	0	0	0	-1
normalized size	1	1.00	0.59	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.598	0.614	0.373	0.000	0.452	0.000	0.000	0.000

Problem 257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	409	410	250	0	0	0	0	0	-1
normalized size	1	1.00	0.61	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.413	0.462	0.366	0.000	0.464	0.000	0.000	0.000

Problem 258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	330	330	237	0	0	0	0	0	-1
normalized size	1	1.00	0.72	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.201	0.361	0.376	0.000	0.421	0.000	0.000	0.000

Problem 259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	345	345	183	0	0	0	0	0	-1
normalized size	1	1.00	0.53	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.394	0.659	0.376	0.000	0.429	0.000	0.000	0.000

Problem 260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	112	112	99	0	118	212	0	0	-1
normalized size	1	1.00	0.88	0.00	1.05	1.89	0.00	0.00	-0.01
time (sec)	N/A	0.104	0.147	0.416	0.608	0.479	0.000	0.000	0.000

Problem 261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	145	0	0	323	0	0	-1
normalized size	1	1.00	0.85	0.00	0.00	1.90	0.00	0.00	-0.01
time (sec)	N/A	0.152	0.197	0.452	0.000	0.494	0.000	0.000	0.000

Problem 262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	230	230	180	0	0	426	0	0	-1
normalized size	1	1.00	0.78	0.00	0.00	1.85	0.00	0.00	-0.00
time (sec)	N/A	0.199	0.244	0.463	0.000	0.544	0.000	0.000	0.000

Problem 263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	231	231	256	0	234	514	0	0	-1
normalized size	1	1.00	1.11	0.00	1.01	2.23	0.00	0.00	-0.00
time (sec)	N/A	0.277	0.359	0.390	1.452	0.528	0.000	0.000	0.000

Problem 264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	177	177	227	0	181	409	0	0	-1
normalized size	1	1.00	1.28	0.00	1.02	2.31	0.00	0.00	-0.01
time (sec)	N/A	0.205	0.210	0.382	1.327	0.497	0.000	0.000	0.000

Problem 265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	181	0	99	304	0	0	-1
normalized size	1	1.00	1.45	0.00	0.79	2.43	0.00	0.00	-0.01
time (sec)	N/A	0.106	0.153	0.374	0.673	0.465	0.000	0.000	0.000

Problem 266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	260	260	301	0	0	0	0	0	-1
normalized size	1	1.00	1.16	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.392	0.838	0.336	0.000	0.413	0.000	0.000	0.000

Problem 267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	295	295	349	0	0	0	0	0	-1
normalized size	1	1.00	1.18	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.442	0.964	0.342	0.000	0.424	0.000	0.000	0.000

Problem 268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	464	464	331	0	0	0	0	0	-1
normalized size	1	1.00	0.71	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.593	1.194	0.329	0.000	0.430	0.000	0.000	0.000

Problem 269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	378	378	314	0	0	0	0	0	-1
normalized size	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.269	1.032	0.337	0.000	0.419	0.000	0.000	0.000

Problem 270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	400	400	329	0	0	0	0	0	-1
normalized size	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.481	1.154	0.347	0.000	0.441	0.000	0.000	0.000

Problem 271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	400	400	269	0	0	0	0	0	-1
normalized size	1	1.00	0.67	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.444	0.775	0.338	0.000	0.432	0.000	0.000	0.000

Problem 272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	114	0	156	314	0	0	-1
normalized size	1	1.00	0.83	0.00	1.13	2.28	0.00	0.00	-0.01
time (sec)	N/A	0.122	0.213	0.418	0.643	0.483	0.000	0.000	0.000

Problem 273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	196	196	145	0	0	423	0	0	-1
normalized size	1	1.00	0.74	0.00	0.00	2.16	0.00	0.00	-0.01
time (sec)	N/A	0.172	0.239	0.463	0.000	0.523	0.000	0.000	0.000

Problem 274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	256	256	178	0	0	526	0	0	-1
normalized size	1	1.00	0.70	0.00	0.00	2.05	0.00	0.00	-0.00
time (sec)	N/A	0.221	0.281	0.510	0.000	0.580	0.000	0.000	0.000

Problem 275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	53	75	39	54	65	54	-1
normalized size	1	1.00	0.88	1.25	0.65	0.90	1.08	0.90	-0.02
time (sec)	N/A	0.045	0.045	0.272	1.302	0.420	25.551	0.316	0.000

Problem 276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	182	182	204	0	206	314	0	0	-1
normalized size	1	1.00	1.12	0.00	1.13	1.73	0.00	0.00	-0.01
time (sec)	N/A	0.228	0.208	0.378	1.339	0.467	0.000	0.000	0.000

Problem 277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	145	0	149	207	0	0	-1
normalized size	1	1.00	1.12	0.00	1.16	1.60	0.00	0.00	-0.01
time (sec)	N/A	0.164	0.166	0.359	1.532	0.462	0.000	0.000	0.000

Problem 278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	91	0	69	124	126	0	-1
normalized size	1	1.00	1.25	0.00	0.95	1.70	1.73	0.00	-0.01
time (sec)	N/A	0.078	0.090	0.349	0.673	0.440	4.813	0.000	0.000

Problem 279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	162	0	0	0	0	0	-1
normalized size	1	1.00	0.98	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.262	0.210	0.341	0.000	0.407	0.000	0.000	0.000

Problem 280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	258	258	229	0	0	0	0	0	-1
normalized size	1	1.00	0.89	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.373	1.105	0.346	0.000	0.410	0.000	0.000	0.000

Problem 281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	359	359	205	0	0	0	0	0	-1
normalized size	1	1.00	0.57	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.410	0.790	0.336	0.000	0.418	0.000	0.000	0.000

Problem 282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	250	250	186	0	0	0	0	0	-1
normalized size	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.139	0.608	0.329	0.000	0.411	0.000	0.000	0.000

Problem 283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	77	0	77	127	0	0	-1
normalized size	1	1.00	0.95	0.00	0.95	1.57	0.00	0.00	-0.01
time (sec)	N/A	0.091	0.107	0.366	0.711	0.446	0.000	0.000	0.000

Problem 284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	110	0	0	223	0	0	-1
normalized size	1	1.00	0.76	0.00	0.00	1.55	0.00	0.00	-0.01
time (sec)	N/A	0.133	0.152	0.389	0.000	0.451	0.000	0.000	0.000

Problem 285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	147	0	0	326	0	0	-1
normalized size	1	1.00	0.72	0.00	0.00	1.60	0.00	0.00	-0.00
time (sec)	N/A	0.177	0.234	0.398	0.000	0.494	0.000	0.000	0.000

Problem 286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	209	209	195	0	244	461	0	0	-1
normalized size	1	1.00	0.93	0.00	1.17	2.21	0.00	0.00	-0.00
time (sec)	N/A	0.296	0.221	0.332	1.468	0.556	0.000	0.000	0.000

Problem 287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	160	0	189	356	0	0	-1
normalized size	1	1.00	1.01	0.00	1.20	2.25	0.00	0.00	-0.01
time (sec)	N/A	0.218	0.187	0.348	1.490	0.516	0.000	0.000	0.000

Problem 288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	118	0	132	245	163	0	-1
normalized size	1	1.00	1.18	0.00	1.32	2.45	1.63	0.00	-0.01
time (sec)	N/A	0.160	0.149	0.337	1.684	0.461	47.867	0.000	0.000

Problem 289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	77	0	59	169	80	0	-1
normalized size	1	1.00	1.35	0.00	1.04	2.96	1.40	0.00	-0.02
time (sec)	N/A	0.078	0.143	0.360	0.596	0.465	12.773	0.000	0.000

Problem 290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	209	209	241	0	0	0	0	0	-1
normalized size	1	1.00	1.15	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.334	0.386	0.339	0.000	0.420	0.000	0.000	0.000

Problem 291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	287	286	218	0	0	0	0	0	-1
normalized size	1	1.00	0.76	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.386	0.359	0.338	0.000	0.428	0.000	0.000	0.000

Problem 292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	328	328	217	0	0	0	0	0	-1
normalized size	1	1.00	0.66	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.474	0.479	0.320	0.000	0.418	0.000	0.000	0.000

Problem 293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	70	0	56	172	0	0	-1
normalized size	1	1.00	1.21	0.00	0.97	2.97	0.00	0.00	-0.02
time (sec)	N/A	0.034	0.104	0.330	0.651	0.444	0.000	0.000	0.000

Problem 294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	103	0	0	241	0	0	-1
normalized size	1	1.00	0.94	0.00	0.00	2.19	0.00	0.00	-0.01
time (sec)	N/A	0.130	0.131	0.342	0.000	0.459	0.000	0.000	0.000

Problem 295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	176	176	144	0	0	370	0	0	-1
normalized size	1	1.00	0.82	0.00	0.00	2.10	0.00	0.00	-0.01
time (sec)	N/A	0.166	0.168	0.334	0.000	0.487	0.000	0.000	0.000

Problem 296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	236	236	180	0	0	473	0	0	-1
normalized size	1	1.00	0.76	0.00	0.00	2.00	0.00	0.00	-0.00
time (sec)	N/A	0.270	0.204	0.337	0.000	0.523	0.000	0.000	0.000

Problem 297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	212	240	0	246	504	0	0	-1
normalized size	1	1.00	1.13	0.00	1.16	2.38	0.00	0.00	-0.00
time (sec)	N/A	0.324	0.265	0.347	1.611	0.538	0.000	0.000	0.000

Problem 298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	205	0	193	401	0	0	-1
normalized size	1	1.00	1.32	0.00	1.25	2.59	0.00	0.00	-0.01
time (sec)	N/A	0.235	0.219	0.326	1.337	0.511	0.000	0.000	0.000

Problem 299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	137	0	137	325	333	0	-1
normalized size	1	1.00	1.27	0.00	1.27	3.01	3.08	0.00	-0.01
time (sec)	N/A	0.161	0.281	0.329	1.428	0.480	57.188	0.000	0.000

Problem 300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	97	0	75	267	245	0	-1
normalized size	1	1.00	1.15	0.00	0.89	3.18	2.92	0.00	-0.01
time (sec)	N/A	0.088	0.241	0.361	0.700	0.476	33.604	0.000	0.000

Problem 301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	251	251	273	0	0	0	0	0	-1
normalized size	1	1.00	1.09	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.404	0.447	0.349	0.000	0.433	0.000	0.000	0.000

Problem 302	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	337	341	227	0	0	0	0	0	-1
normalized size	1	1.01	0.67	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.488	0.285	0.335	0.000	0.435	0.000	0.000	0.000

Problem 303	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	443	443	199	0	0	0	0	0	-1
normalized size	1	1.00	0.45	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.539	0.281	0.333	0.000	0.439	0.000	0.000	0.000

Problem 304	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	383	383	244	0	0	0	0	0	-1
normalized size	1	1.00	0.64	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.557	0.867	0.345	0.000	0.427	0.000	0.000	0.000

Problem 305	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	101	0	0	277	0	0	-1
normalized size	1	1.00	1.13	0.00	0.00	3.11	0.00	0.00	-0.01
time (sec)	N/A	0.109	0.155	0.331	0.000	0.468	0.000	0.000	0.000

Problem 306	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	116	0	0	337	0	0	-1
normalized size	1	1.00	1.03	0.00	0.00	2.98	0.00	0.00	-0.01
time (sec)	N/A	0.069	0.139	0.344	0.000	0.466	0.000	0.000	0.000

Problem 307	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	144	0	0	399	0	0	-1
normalized size	1	1.00	0.87	0.00	0.00	2.40	0.00	0.00	-0.01
time (sec)	N/A	0.169	0.191	0.341	0.000	0.495	0.000	0.000	0.000

Problem 308	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	230	230	182	0	0	520	0	0	-1
normalized size	1	1.00	0.79	0.00	0.00	2.26	0.00	0.00	-0.00
time (sec)	N/A	0.259	0.226	0.332	0.000	0.563	0.000	0.000	0.000

Problem 309	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	251	251	163	0	199	125	0	0	-1
normalized size	1	1.00	0.65	0.00	0.79	0.50	0.00	0.00	-0.00
time (sec)	N/A	0.520	0.404	0.545	1.543	0.484	0.000	0.000	0.000

Problem 310	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	113	0	105	66	0	0	-1
normalized size	1	1.00	0.76	0.00	0.71	0.45	0.00	0.00	-0.01
time (sec)	N/A	0.296	0.184	0.502	1.457	0.444	0.000	0.000	0.000

Problem 311	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	301	301	310	0	0	0	0	0	-1
normalized size	1	1.00	1.03	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.605	1.826	0.475	0.000	0.430	0.000	0.000	0.000

Problem 312	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	489	489	255	0	0	0	0	0	-1
normalized size	1	1.00	0.52	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.724	0.884	0.500	0.000	0.420	0.000	0.000	0.000

Problem 313	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	406	406	316	0	0	0	0	0	-1
normalized size	1	1.00	0.78	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.612	2.791	0.504	0.000	0.422	0.000	0.000	0.000

Problem 314	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	248	248	217	0	0	0	0	0	-1
normalized size	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.216	0.549	0.483	0.000	0.406	0.000	0.000	0.000

Problem 315	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	70	0	88	73	0	0	-1
normalized size	1	1.00	0.49	0.00	0.62	0.51	0.00	0.00	-0.01
time (sec)	N/A	0.400	0.228	0.500	1.242	0.438	0.000	0.000	0.000

Problem 316	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	252	116	0	0	135	0	0	-1
normalized size	1	1.00	0.46	0.00	0.00	0.54	0.00	0.00	-0.00
time (sec)	N/A	0.475	0.308	0.552	0.000	0.465	0.000	0.000	0.000

Problem 317	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	27	119	27	27	29	28	-1
normalized size	1	1.00	0.79	3.50	0.79	0.79	0.85	0.82	-0.03
time (sec)	N/A	0.040	0.027	0.269	1.291	0.416	2.682	0.342	0.000

Problem 318	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	156	5139	271	1222	0	553	-1
normalized size	1	1.00	0.74	24.36	1.28	5.79	0.00	2.62	-0.00
time (sec)	N/A	1.684	0.269	0.622	0.827	0.447	0.000	0.623	0.000

Problem 319	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	112	2790	195	633	3850	396	-1
normalized size	1	1.00	0.73	18.24	1.27	4.14	25.16	2.59	-0.01
time (sec)	N/A	0.180	0.198	0.395	0.849	0.429	64.063	0.421	0.000

Problem 320	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	68	1180	119	235	1261	239	-1
normalized size	1	1.00	0.72	12.42	1.25	2.47	13.27	2.52	-0.01
time (sec)	N/A	0.085	0.080	0.253	1.117	0.412	15.804	0.386	0.000

Problem 321	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	32	371	57	52	192	95	-1
normalized size	1	1.00	0.70	8.07	1.24	1.13	4.17	2.07	-0.02
time (sec)	N/A	0.017	0.013	0.072	1.020	0.411	9.891	0.360	0.000

Problem 322	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	28	0	108	0	0	0	0	0	-1
normalized size	1	0.00	3.86	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.067	0.208	0.701	0.000	0.412	0.000	0.000	0.000

Problem 323	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	28	0	108	0	0	0	0	0	-1
normalized size	1	0.00	3.86	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	0.129	0.821	0.000	0.431	0.000	0.000	0.000

Problem 324	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1198	1198	2215	0	0	0	0	0	-1
normalized size	1	1.00	1.85	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.435	7.802	31.117	0.000	0.394	0.000	0.000	0.000

Problem 325	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	860	860	1379	0	0	0	0	0	-1
normalized size	1	1.00	1.60	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.771	6.158	41.436	0.000	0.400	0.000	0.000	0.000

Problem 326	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	520	520	571	1388	0	0	0	0	-1
normalized size	1	1.00	1.10	2.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.457	1.874	0.371	0.000	0.413	0.000	0.000	0.000

Problem 327	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	5.628	0.676	0.000	0.411	0.000	0.000	0.000

Problem 328	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.030	25.674	2.488	0.000	0.412	0.000	0.000	0.000

Problem 329	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	171	867	0	0	298	0	-1
normalized size	1	1.00	0.92	4.69	0.00	0.00	1.61	0.00	-0.01
time (sec)	N/A	0.200	0.107	0.229	0.000	0.395	164.128	0.000	0.000

Problem 330	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	142	693	0	0	248	0	-1
normalized size	1	1.00	0.96	4.68	0.00	0.00	1.68	0.00	-0.01
time (sec)	N/A	0.168	0.073	0.220	0.000	0.413	138.052	0.000	0.000

Problem 331	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	105	521	0	0	199	0	-1
normalized size	1	1.00	0.98	4.87	0.00	0.00	1.86	0.00	-0.01
time (sec)	N/A	0.120	0.050	0.205	0.000	0.395	114.155	0.000	0.000

Problem 332	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	66	343	0	0	144	0	-1
normalized size	1	1.00	0.96	4.97	0.00	0.00	2.09	0.00	-0.01
time (sec)	N/A	0.078	0.033	0.240	0.000	0.414	72.457	0.000	0.000

Problem 333	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	37	195	0	0	0	0	-1
normalized size	1	1.00	0.95	5.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.075	0.007	0.192	0.000	0.402	0.000	0.000	0.000

Problem 334	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	63	336	0	0	156	0	-1
normalized size	1	1.00	1.43	7.64	0.00	0.00	3.55	0.00	-0.02
time (sec)	N/A	0.066	0.034	0.179	0.000	0.406	14.689	0.000	0.000

Problem 335	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	88	504	0	0	197	0	-1
normalized size	1	1.00	0.93	5.31	0.00	0.00	2.07	0.00	-0.01
time (sec)	N/A	0.147	0.088	0.200	0.000	0.418	64.250	0.000	0.000

Problem 336	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	124	689	0	0	246	0	-1
normalized size	1	1.00	0.92	5.10	0.00	0.00	1.82	0.00	-0.01
time (sec)	N/A	0.177	0.208	0.197	0.000	0.398	88.475	0.000	0.000

Problem 337	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	156	209	210	0	280	0	-1
normalized size	1	1.00	0.92	1.23	1.24	0.00	1.65	0.00	-0.01
time (sec)	N/A	0.181	0.082	0.069	0.870	0.397	161.983	0.000	0.000

Problem 338	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	125	171	164	0	235	0	-1
normalized size	1	1.00	0.92	1.26	1.21	0.00	1.73	0.00	-0.01
time (sec)	N/A	0.152	0.066	0.046	0.936	0.407	136.434	0.000	0.000

Problem 339	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	99	129	112	0	189	0	-1
normalized size	1	1.00	1.01	1.32	1.14	0.00	1.93	0.00	-0.01
time (sec)	N/A	0.110	0.043	0.041	0.942	0.408	112.583	0.000	0.000

Problem 340	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	64	91	69	0	138	0	-1
normalized size	1	1.00	1.02	1.44	1.10	0.00	2.19	0.00	-0.02
time (sec)	N/A	0.070	0.029	0.043	0.887	0.411	71.222	0.000	0.000

Problem 341	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	34	62	43	0	0	0	-1
normalized size	1	1.00	0.94	1.72	1.19	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.071	0.007	0.040	0.848	0.414	0.000	0.000	0.000

Problem 342	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	54	86	67	0	153	0	-1
normalized size	1	1.00	1.32	2.10	1.63	0.00	3.73	0.00	-0.02
time (sec)	N/A	0.062	0.025	0.049	0.852	0.413	14.258	0.000	0.000

Problem 343	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	77	120	96	0	187	0	-1
normalized size	1	1.00	0.92	1.43	1.14	0.00	2.23	0.00	-0.01
time (sec)	N/A	0.131	0.089	0.051	0.934	0.410	62.911	0.000	0.000

Problem 344	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	110	163	151	0	233	0	-1
normalized size	1	1.00	0.91	1.35	1.25	0.00	1.93	0.00	-0.01
time (sec)	N/A	0.156	0.147	0.053	0.984	0.398	86.814	0.000	0.000

Problem 345	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	F(-2)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	52	39	0	0	13
normalized size	1	1.00	1.00	0.82	3.06	2.29	0.00	0.00	0.76
time (sec)	N/A	0.065	0.011	0.040	1.562	0.409	0.000	0.000	3.526

Problem 346	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	F(-2)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	17	13	45	50	0	0	12
normalized size	1	1.00	1.06	0.81	2.81	3.12	0.00	0.00	0.75
time (sec)	N/A	0.063	0.010	0.042	1.642	0.424	0.000	0.000	3.478

Problem 347	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	F(-2)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	21	19	64	55	0	0	18
normalized size	1	1.00	1.05	0.95	3.20	2.75	0.00	0.00	0.90
time (sec)	N/A	0.069	0.010	0.039	1.674	0.425	0.000	0.000	3.526

Problem 348	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	C	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	16	11	72	13	71	0	10
normalized size	1	1.00	1.14	0.79	5.14	0.93	5.07	0.00	0.71
time (sec)	N/A	0.077	0.004	0.039	0.753	0.394	9.320	0.000	3.463

Problem 349	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	C	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	21	12	81	14	78	0	11
normalized size	1	1.00	1.24	0.71	4.76	0.82	4.59	0.00	0.65
time (sec)	N/A	0.087	0.005	0.043	0.612	0.397	11.314	0.000	3.501

Problem 350	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	23	0	0	89	0	0	-1
normalized size	1	1.00	0.88	0.00	0.00	3.42	0.00	0.00	-0.04
time (sec)	N/A	0.090	0.010	0.931	0.000	0.416	0.000	0.000	0.000

Problem 351	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	140	806	253	193	0	351	-1
normalized size	1	1.00	0.82	4.71	1.48	1.13	0.00	2.05	-0.01
time (sec)	N/A	0.215	0.157	0.317	0.746	0.427	0.000	0.780	0.000

Problem 352	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	101	616	180	135	0	257	-1
normalized size	1	1.00	0.71	4.34	1.27	0.95	0.00	1.81	-0.01
time (sec)	N/A	0.195	0.116	0.254	0.700	0.426	0.000	0.735	0.000

Problem 353	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	113	61	426	109	76	0	166	-1
normalized size	1	1.26	0.68	4.73	1.21	0.84	0.00	1.84	-0.01
time (sec)	N/A	0.117	0.066	0.226	0.735	0.435	0.000	0.545	0.000

Problem 354	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	29	281	48	42	148	80	-1
normalized size	1	1.00	0.76	7.39	1.26	1.11	3.89	2.11	-0.03
time (sec)	N/A	0.017	0.010	0.158	0.717	0.421	22.251	0.317	0.000

Problem 355	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	141	0	0	77	0	0	-1
normalized size	1	1.00	1.83	0.00	0.00	1.00	0.00	0.00	-0.01
time (sec)	N/A	0.191	0.146	1.058	0.000	0.441	0.000	0.000	0.000

Problem 356	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	89	0	97	89	0	206	-1
normalized size	1	1.00	1.29	0.00	1.41	1.29	0.00	2.99	-0.01
time (sec)	N/A	0.107	0.122	1.266	0.716	0.413	0.000	0.452	0.000

Problem 357	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	137	0	152	167	0	628	-1
normalized size	1	1.00	0.91	0.00	1.01	1.11	0.00	4.19	-0.01
time (sec)	N/A	0.215	0.150	1.245	0.770	0.412	0.000	0.477	0.000

Problem 358	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	178	0	210	242	0	1080	-1
normalized size	1	1.00	0.95	0.00	1.12	1.29	0.00	5.74	-0.01
time (sec)	N/A	0.234	0.161	1.089	0.814	0.422	0.000	0.639	0.000

Problem 359	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	372	294	285	4156	578	592	0	1009	-1
normalized size	1	0.79	0.77	11.17	1.55	1.59	0.00	2.71	-0.00
time (sec)	N/A	0.481	0.259	0.714	1.181	0.446	0.000	1.570	0.000

Problem 360	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	298	245	207	3038	417	419	0	739	-1
normalized size	1	0.82	0.69	10.19	1.40	1.41	0.00	2.48	-0.00
time (sec)	N/A	0.440	0.200	0.510	0.730	0.433	0.000	0.959	0.000

Problem 361	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	226	195	125	1920	257	244	0	469	-1
normalized size	1	0.86	0.55	8.50	1.14	1.08	0.00	2.08	-0.00
time (sec)	N/A	0.303	0.132	0.381	1.143	0.427	0.000	0.753	0.000

Problem 362	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	67	1008	117	124	490	222	-1
normalized size	1	1.00	0.97	14.61	1.70	1.80	7.10	3.22	-0.01
time (sec)	N/A	0.050	0.023	0.230	1.068	0.460	68.772	0.593	0.000

Problem 363	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	C	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	502	0	0	178	0	0	-1
normalized size	1	1.00	3.89	0.00	0.00	1.38	0.00	0.00	-0.01
time (sec)	N/A	0.301	0.265	1.108	0.000	0.466	0.000	0.000	0.000

Problem 364	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	157	0	0	266	0	0	-1
normalized size	1	1.00	1.14	0.00	0.00	1.93	0.00	0.00	-0.01
time (sec)	N/A	0.340	0.452	0.965	0.000	0.441	0.000	0.000	0.000

Problem 365	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	214	214	207	0	0	535	0	0	-1
normalized size	1	1.00	0.97	0.00	0.00	2.50	0.00	0.00	-0.00
time (sec)	N/A	0.512	0.356	0.953	0.000	0.433	0.000	0.000	0.000

Problem 366	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	346	346	240	0	0	810	0	0	-1
normalized size	1	1.00	0.69	0.00	0.00	2.34	0.00	0.00	-0.00
time (sec)	N/A	0.714	0.532	0.980	0.000	0.486	0.000	0.000	0.000

Problem 367	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	73	613	76	159	525	137	-1
normalized size	1	1.00	1.24	10.39	1.29	2.69	8.90	2.32	-0.02
time (sec)	N/A	0.079	0.108	0.272	0.963	0.467	141.142	0.354	0.000

Problem 368	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	73	613	76	159	525	137	-1
normalized size	1	1.00	1.24	10.39	1.29	2.69	8.90	2.32	-0.02
time (sec)	N/A	0.080	0.096	0.267	0.987	0.442	30.317	0.359	0.000

Problem 369	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	73	613	76	159	525	137	-1
normalized size	1	1.00	1.24	10.39	1.29	2.69	8.90	2.32	-0.02
time (sec)	N/A	0.063	0.094	0.264	1.050	0.462	5.849	0.343	0.000

Problem 370	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	54	278	56	64	112	69	-1
normalized size	1	1.00	1.02	5.25	1.06	1.21	2.11	1.30	-0.02
time (sec)	N/A	0.088	0.090	0.263	1.017	0.428	9.855	0.376	0.000

Problem 371	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	63	72	613	0	140	644	396	-1
normalized size	1	0.89	1.01	8.63	0.00	1.97	9.07	5.58	-0.01
time (sec)	N/A	0.074	0.113	0.232	0.000	0.458	8.939	0.399	0.000

Problem 372	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	63	72	613	0	140	644	397	-1
normalized size	1	0.89	1.01	8.63	0.00	1.97	9.07	5.59	-0.01
time (sec)	N/A	0.074	0.116	0.235	0.000	0.490	27.559	0.507	0.000

Problem 373	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	73	614	76	159	525	137	-1
normalized size	1	1.00	1.24	10.41	1.29	2.69	8.90	2.32	-0.02
time (sec)	N/A	0.080	0.093	0.269	1.120	0.428	69.726	0.410	0.000

Problem 374	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	73	614	76	159	525	137	-1
normalized size	1	1.00	1.24	10.41	1.29	2.69	8.90	2.32	-0.02
time (sec)	N/A	0.080	0.095	0.269	0.995	0.465	13.461	0.369	0.000

Problem 375	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	49	53	606	68	138	423	115	-1
normalized size	1	0.86	0.93	10.63	1.19	2.42	7.42	2.02	-0.02
time (sec)	N/A	0.034	0.128	0.269	0.961	0.414	2.370	0.387	0.000

Problem 376	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	58	67	614	0	130	449	193	-1
normalized size	1	0.87	1.00	9.16	0.00	1.94	6.70	2.88	-0.01
time (sec)	N/A	0.077	0.109	0.222	0.000	0.502	6.862	0.417	0.000

Problem 377	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	63	72	614	0	140	644	397	-1
normalized size	1	0.89	1.01	8.65	0.00	1.97	9.07	5.59	-0.01
time (sec)	N/A	0.073	0.117	0.227	0.000	0.436	14.945	0.423	0.000

Problem 378	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	63	72	614	0	140	644	397	-1
normalized size	1	0.89	1.01	8.65	0.00	1.97	9.07	5.59	-0.01
time (sec)	N/A	0.072	0.097	0.235	0.000	0.464	53.332	0.468	0.000

Problem 379	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	118	1924	148	489	0	744	-1
normalized size	1	1.00	1.15	18.68	1.44	4.75	0.00	7.22	-0.01
time (sec)	N/A	0.156	0.279	0.352	1.093	0.469	0.000	0.497	0.000

Problem 380	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	118	1924	148	488	2162	744	-1
normalized size	1	1.00	1.15	18.68	1.44	4.74	20.99	7.22	-0.01
time (sec)	N/A	0.154	0.260	0.345	1.004	0.450	116.276	0.515	0.000

Problem 381	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	116	1922	148	488	2159	744	-1
normalized size	1	1.00	1.14	18.84	1.45	4.78	21.17	7.29	-0.01
time (sec)	N/A	0.132	0.240	0.351	1.003	0.488	18.568	0.439	0.000

Problem 382	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	87	90	487	114	115	199	140	-1
normalized size	1	0.84	0.87	4.68	1.10	1.11	1.91	1.35	-0.01
time (sec)	N/A	0.134	0.216	0.263	0.992	0.483	13.998	0.431	0.000

Problem 383	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	114	120	1923	0	457	2807	0	-1
normalized size	1	0.84	0.89	14.24	0.00	3.39	20.79	0.00	-0.01
time (sec)	N/A	0.163	0.316	0.330	0.000	0.485	15.655	0.000	0.000

Problem 384	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	115	121	1924	0	457	2815	0	-1
normalized size	1	0.85	0.90	14.25	0.00	3.39	20.85	0.00	-0.01
time (sec)	N/A	0.164	0.316	0.318	0.000	0.489	49.703	0.000	0.000

Problem 385	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	124	1930	152	497	0	746	-1
normalized size	1	1.00	1.18	18.38	1.45	4.73	0.00	7.10	-0.01
time (sec)	N/A	0.160	0.262	0.368	1.063	0.432	0.000	0.403	0.000

Problem 386	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	124	1930	152	497	0	746	-1
normalized size	1	1.00	1.18	18.38	1.45	4.73	0.00	7.10	-0.01
time (sec)	N/A	0.160	0.267	0.356	1.059	0.473	0.000	0.377	0.000

Problem 387	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	95	107	1921	144	466	211	244	-1
normalized size	1	0.84	0.95	17.00	1.27	4.12	1.87	2.16	-0.01
time (sec)	N/A	0.076	0.167	0.342	1.022	0.477	13.917	0.362	0.000

Problem 388	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	104	121	1927	0	455	204	0	-1
normalized size	1	0.85	0.98	15.67	0.00	3.70	1.66	0.00	-0.01
time (sec)	N/A	0.167	0.299	0.334	0.000	0.472	36.634	0.000	0.000

Problem 389	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	109	127	1930	0	466	235	0	-1
normalized size	1	0.86	1.00	15.20	0.00	3.67	1.85	0.00	-0.01
time (sec)	N/A	0.173	0.311	0.349	0.000	0.461	93.827	0.000	0.000

Problem 390	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	109	127	1930	0	466	0	0	-1
normalized size	1	0.86	1.00	15.20	0.00	3.67	0.00	0.00	-0.01
time (sec)	N/A	0.173	0.313	0.320	0.000	0.478	0.000	0.000	0.000

Problem 391	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	109	127	1930	0	466	0	0	-1
normalized size	1	0.86	1.00	15.20	0.00	3.67	0.00	0.00	-0.01
time (sec)	N/A	0.177	0.303	0.339	0.000	0.482	0.000	0.000	0.000

Problem 392	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	172	4021	218	1011	0	1586	-1
normalized size	1	1.00	1.17	27.35	1.48	6.88	0.00	10.79	-0.01
time (sec)	N/A	0.381	0.390	0.493	1.034	0.510	0.000	0.567	0.000

Problem 393	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	178	4027	222	1022	0	1588	-1
normalized size	1	1.00	1.19	27.03	1.49	6.86	0.00	10.66	-0.01
time (sec)	N/A	0.385	0.357	0.488	1.040	0.511	0.000	0.491	0.000

Problem 394	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	178	4027	222	1024	0	1588	-1
normalized size	1	1.00	1.19	27.03	1.49	6.87	0.00	10.66	-0.01
time (sec)	N/A	0.348	0.360	0.488	1.009	0.459	0.000	0.538	0.000

Problem 395	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	124	132	693	172	169	286	210	-1
normalized size	1	0.82	0.87	4.56	1.13	1.11	1.88	1.38	-0.01
time (sec)	N/A	0.171	0.374	0.285	1.038	0.438	19.733	0.366	0.000

Problem 396	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	161	181	4027	0	981	350	0	-1
normalized size	1	0.84	0.95	21.08	0.00	5.14	1.83	0.00	-0.01
time (sec)	N/A	0.408	0.419	0.490	0.000	0.515	141.143	0.000	0.000

Problem 397	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	161	181	4027	0	980	0	0	-1
normalized size	1	0.84	0.95	21.08	0.00	5.13	0.00	0.00	-0.01
time (sec)	N/A	0.397	0.413	0.492	0.000	0.513	0.000	0.000	0.000

Problem 398	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	184	4031	228	1023	0	1588	-1
normalized size	1	1.00	1.22	26.70	1.51	6.77	0.00	10.52	-0.01
time (sec)	N/A	0.381	0.367	0.506	1.384	0.497	0.000	0.602	0.000

Problem 399	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	176	4027	224	1022	0	1588	-1
normalized size	1	1.00	1.19	27.21	1.51	6.91	0.00	10.73	-0.01
time (sec)	N/A	0.381	0.357	0.502	1.353	0.522	0.000	0.459	0.000

Problem 400	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	169	141	159	4023	220	983	325	374	-1
normalized size	1	0.83	0.94	23.80	1.30	5.82	1.92	2.21	-0.01
time (sec)	N/A	0.103	0.236	0.486	1.442	0.526	22.758	0.329	0.000

Problem 401	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	150	181	4031	0	967	314	0	-1
normalized size	1	0.84	1.01	22.52	0.00	5.40	1.75	0.00	-0.01
time (sec)	N/A	0.397	0.416	0.506	0.000	0.468	62.803	0.000	0.000

Problem 402	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	160	180	4027	0	980	350	0	-1
normalized size	1	0.84	0.94	21.08	0.00	5.13	1.83	0.00	-0.01
time (sec)	N/A	0.393	0.394	0.489	0.000	0.484	178.894	0.000	0.000

Problem 403	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	155	187	4031	0	981	0	0	-1
normalized size	1	0.85	1.02	22.03	0.00	5.36	0.00	0.00	-0.01
time (sec)	N/A	0.412	0.420	0.521	0.000	0.441	0.000	0.000	0.000

Problem 404	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	155	188	4031	0	981	0	0	-1
normalized size	1	0.85	1.03	22.03	0.00	5.36	0.00	0.00	-0.01
time (sec)	N/A	0.413	0.411	0.513	0.000	0.442	0.000	0.000	0.000

Problem 405	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-2)	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	161	182	4027	0	981	0	0	-1
normalized size	1	0.84	0.95	21.08	0.00	5.14	0.00	0.00	-0.01
time (sec)	N/A	0.419	0.415	0.523	0.000	0.441	0.000	0.000	0.000

Problem 406	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	87	0	0	0	0	0	-1
normalized size	1	0.00	3.35	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	0.124	0.785	0.000	0.401	0.000	0.000	0.000

Problem 407	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	87	0	0	0	0	0	-1
normalized size	1	0.00	3.62	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.041	0.107	0.694	0.000	0.401	0.000	0.000	0.000

Problem 408	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	108	451	0	93	0	0	-1
normalized size	1	1.00	2.00	8.35	0.00	1.72	0.00	0.00	-0.02
time (sec)	N/A	0.078	0.121	0.246	0.000	0.411	0.000	0.000	0.000

Problem 409	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	86	0	0	0	0	0	-1
normalized size	1	0.00	3.31	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	0.117	0.763	0.000	0.451	0.000	0.000	0.000

Problem 410	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	87	0	0	0	0	0	-1
normalized size	1	0.00	3.35	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.065	0.115	0.717	0.000	0.446	0.000	0.000	0.000

Problem 411	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	69	0	0	0	0	0	-1
normalized size	1	0.00	3.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.018	0.086	0.639	0.000	0.430	0.000	0.000	0.000

Problem 412	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	83	0	0	0	0	0	-1
normalized size	1	0.00	3.19	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.066	0.103	0.725	0.000	0.430	0.000	0.000	0.000

Problem 413	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	140	0	0	0	0	0	-1
normalized size	1	0.00	5.38	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	0.262	0.668	0.000	0.447	0.000	0.000	0.000

Problem 414	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	140	0	0	0	0	0	-1
normalized size	1	0.00	5.83	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.040	0.239	0.743	0.000	0.430	0.000	0.000	0.000

Problem 415	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	B	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	132	715	0	214	0	0	-1
normalized size	1	1.00	1.29	7.01	0.00	2.10	0.00	0.00	-0.01
time (sec)	N/A	0.233	0.377	0.298	0.000	0.435	0.000	0.000	0.000

Problem 416	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	205	0	0	0	0	0	-1
normalized size	1	0.00	7.88	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	3.160	0.666	0.000	0.408	0.000	0.000	0.000

Problem 417	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	140	0	0	0	0	0	-1
normalized size	1	0.00	5.38	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	0.250	0.815	0.000	0.439	0.000	0.000	0.000

Problem 418	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	161	0	0	0	0	0	-1
normalized size	1	0.00	7.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.017	2.620	0.688	0.000	0.411	0.000	0.000	0.000

Problem 419	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	135	0	0	0	0	0	-1
normalized size	1	0.00	5.19	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.062	0.205	0.792	0.000	0.414	0.000	0.000	0.000

Problem 420	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	33	0	45	0	0	-1
normalized size	1	1.00	1.00	0.89	0.00	1.22	0.00	0.00	-0.03
time (sec)	N/A	0.144	0.019	0.039	0.000	0.442	0.000	0.000	0.000

Problem 421	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	124	132	693	172	169	286	210	-1
normalized size	1	0.82	0.87	4.56	1.13	1.11	1.88	1.38	-0.01
time (sec)	N/A	0.154	0.339	0.096	1.021	0.427	20.729	0.305	0.000

Problem 422	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	87	90	487	114	115	199	140	-1
normalized size	1	0.84	0.87	4.68	1.10	1.11	1.91	1.35	-0.01
time (sec)	N/A	0.127	0.217	0.075	1.241	0.424	13.252	0.383	0.000

Problem 423	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	54	278	56	64	112	69	-1
normalized size	1	1.00	1.02	5.25	1.06	1.21	2.11	1.30	-0.02
time (sec)	N/A	0.085	0.087	0.069	1.101	0.413	10.087	0.369	0.000

Problem 424	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	108	451	0	93	0	0	-1
normalized size	1	1.00	2.00	8.35	0.00	1.72	0.00	0.00	-0.02
time (sec)	N/A	0.075	0.108	0.060	0.000	0.437	0.000	0.000	0.000

Problem 425	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	B	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	132	715	0	214	0	0	-1
normalized size	1	1.00	1.29	7.01	0.00	2.10	0.00	0.00	-0.01
time (sec)	N/A	0.229	0.299	0.065	0.000	0.418	0.000	0.000	0.000

Problem 426	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	B	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	169	169	170	1012	0	401	0	0	-1
normalized size	1	1.00	1.01	5.99	0.00	2.37	0.00	0.00	-0.01
time (sec)	N/A	0.409	0.238	0.305	0.000	0.747	0.000	0.000	0.000

Problem 427	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	245	245	262	3984	391	521	816	634	-1
normalized size	1	1.00	1.07	16.26	1.60	2.13	3.33	2.59	-0.00
time (sec)	N/A	0.303	0.449	0.617	1.356	0.790	50.701	0.468	0.000

Problem 428	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	179	2844	259	353	546	421	-1
normalized size	1	1.00	1.11	17.66	1.61	2.19	3.39	2.61	-0.01
time (sec)	N/A	0.237	0.273	0.530	1.375	0.693	33.782	0.320	0.000

Problem 429	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	109	1712	131	193	309	219	-1
normalized size	1	1.00	1.36	21.40	1.64	2.41	3.86	2.74	-0.01
time (sec)	N/A	0.139	0.148	0.469	1.259	0.818	25.983	0.318	0.000

Problem 430	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	C	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	270	3012	0	228	0	0	-1
normalized size	1	1.00	2.87	32.04	0.00	2.43	0.00	0.00	-0.01
time (sec)	N/A	0.135	0.308	0.338	0.000	0.637	0.000	0.000	0.000

Problem 431	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	C	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	182	182	397	0	0	600	0	0	-1
normalized size	1	1.00	2.18	0.00	0.00	3.30	0.00	0.00	-0.01
time (sec)	N/A	0.427	0.397	0.985	0.000	0.624	0.000	0.000	0.000

Problem 432	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	C	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	459	0	0	1165	0	0	-1
normalized size	1	1.00	1.72	0.00	0.00	4.36	0.00	0.00	-0.00
time (sec)	N/A	0.892	0.607	0.852	0.000	0.799	0.000	0.000	0.000

Problem 433	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F(-2)	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	327	327	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.480	0.551	0.594	0.000	0.000	0.000	0.000	0.000

Problem 434	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F(-2)	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	284	284	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.391	0.443	0.536	0.000	0.000	0.000	0.000	0.000

Problem 435	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F(-2)	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	240	240	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.317	0.350	0.579	0.000	0.000	0.000	0.000	0.000

Problem 436	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F(-2)	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	174	174	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.269	0.118	0.680	0.000	0.000	0.000	0.000	0.000

Problem 437	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F(-2)	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	225	225	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.343	0.300	0.403	0.000	0.000	0.000	0.000	0.000

Problem 438	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F(-2)	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	271	271	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.416	0.365	0.416	0.000	0.000	0.000	0.000	0.000

Problem 439	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F(-2)	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	314	314	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.471	0.424	0.421	0.000	0.000	0.000	0.000	0.000

Problem 440	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	233	233	178	22706	343	4918	0	766	-1
normalized size	1	1.00	0.76	97.45	1.47	21.11	0.00	3.29	-0.00
time (sec)	N/A	1.987	0.481	2.055	1.596	1.242	0.000	0.788	0.000

Problem 441	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	124	8737	240	1875	0	528	-1
normalized size	1	1.00	0.75	52.95	1.45	11.36	0.00	3.20	-0.01
time (sec)	N/A	0.185	0.260	0.966	1.637	0.846	0.000	0.548	0.000

Problem 442	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	70	2152	137	431	6356	291	-1
normalized size	1	1.00	0.72	22.19	1.41	4.44	65.53	3.00	-0.01
time (sec)	N/A	0.103	0.125	0.468	1.102	0.878	116.667	0.517	0.000

Problem 443	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	32	371	57	52	192	95	-1
normalized size	1	1.00	0.70	8.07	1.24	1.13	4.17	2.07	-0.02
time (sec)	N/A	0.017	0.014	0.070	1.010	0.972	10.367	0.296	0.000

Problem 444	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	28	0	111	0	0	0	0	0	-1
normalized size	1	0.00	3.96	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.070	0.156	1.096	0.000	0.787	0.000	0.000	0.000

Problem 445	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	28	0	177	0	0	0	0	0	-1
normalized size	1	0.00	6.32	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.069	0.386	1.258	0.000	0.770	0.000	0.000	0.000

Problem 446	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	143	0	0	0	0	0	-1
normalized size	1	1.00	1.40	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.044	0.590	0.664	0.000	0.834	0.000	0.000	0.000

Problem 447	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	98	0	0	0	0	0	-1
normalized size	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.133	0.345	0.742	0.000	0.759	0.000	0.000	0.000

Problem 448	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	480	480	408	0	0	0	0	0	-1
normalized size	1	1.00	0.85	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.660	1.898	1.561	0.000	0.664	0.000	0.000	0.000

Problem 449	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	350	350	304	0	0	0	0	0	-1
normalized size	1	1.00	0.87	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.413	0.970	1.321	0.000	0.636	0.000	0.000	0.000

Problem 450	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	200	0	0	0	0	0	-1
normalized size	1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.256	0.462	1.623	0.000	0.881	0.000	0.000	0.000

Problem 451	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	107	0	0	0	0	0	-1
normalized size	1	1.00	1.01	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.067	0.067	1.684	0.000	0.717	0.000	0.000	0.000

Problem 452	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.100	3.068	0.881	0.000	0.797	0.000	0.000	0.000

Problem 453	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.102	3.252	0.885	0.000	0.743	0.000	0.000	0.000

Problem 454	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	151	108	624	218	215	1090	252	174
normalized size	1	1.31	0.94	5.43	1.90	1.87	9.48	2.19	1.51
time (sec)	N/A	0.146	0.179	0.319	1.117	0.849	8.299	0.359	4.002

Problem 455	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	278	244	2163	0	0	0	0	-1
normalized size	1	1.38	1.21	10.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.405	0.251	0.389	0.000	0.627	0.000	0.000	0.000

Problem 456	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	295	408	339	0	0	0	0	0	-1
normalized size	1	1.38	1.15	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.624	0.388	1.747	0.000	0.734	0.000	0.000	0.000

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [120] had the largest ratio of [.7692]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	4	3	1.00	19	0.158
2	A	4	3	1.00	19	0.158
3	A	4	3	1.00	17	0.176
4	A	2	1	0.85	16	0.062
5	A	4	3	1.00	19	0.158
6	A	4	4	0.90	19	0.210
7	A	4	4	1.00	19	0.210
8	A	4	3	0.84	19	0.158
9	A	4	4	1.00	21	0.190
10	A	4	4	1.00	21	0.190
11	A	4	4	1.00	19	0.210
12	A	4	4	1.00	18	0.222
13	A	3	3	0.79	21	0.143
14	A	3	3	0.78	21	0.143
15	A	4	4	0.80	21	0.190
16	A	4	4	1.00	21	0.190
17	A	4	4	0.78	21	0.190
18	A	4	4	0.78	21	0.190
19	A	4	4	1.00	21	0.190
20	A	4	4	1.00	21	0.190

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
21	A	5	4	1.00	19	0.210
22	A	4	4	1.00	18	0.222
23	A	4	3	0.77	21	0.143
24	A	3	3	0.77	21	0.143
25	A	3	3	0.77	21	0.143
26	A	5	4	0.78	21	0.190
27	A	4	4	1.00	21	0.190
28	A	5	6	0.94	21	0.286
29	A	4	4	0.75	21	0.190
30	A	4	4	0.75	21	0.190
31	A	8	6	1.00	21	0.286
32	A	7	6	1.00	21	0.286
33	A	6	5	1.00	19	0.263
34	A	2	2	1.00	18	0.111
35	A	4	4	1.50	21	0.190
36	A	6	6	1.28	21	0.286
37	A	7	6	1.23	21	0.286
38	A	8	6	1.15	21	0.286
39	A	9	8	0.99	21	0.381
40	A	8	7	1.08	21	0.333
41	A	6	6	1.14	19	0.316
42	A	2	2	1.00	18	0.111
43	A	7	7	1.28	21	0.333
44	A	8	8	1.18	21	0.381
45	A	9	8	1.16	21	0.381
46	A	11	9	1.12	21	0.429
47	A	9	8	1.23	21	0.381
48	A	3	2	1.00	19	0.105
49	A	3	2	1.00	18	0.111
50	A	11	9	1.16	21	0.429
51	A	11	9	1.13	21	0.429
52	A	12	9	1.10	21	0.429
53	A	15	10	1.14	21	0.476
54	A	14	9	1.15	21	0.429
55	A	12	8	1.26	21	0.381
56	A	3	2	1.00	21	0.095

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
57	A	4	4	1.00	19	0.210
58	A	3	2	1.00	18	0.111
59	A	15	9	1.13	21	0.429
60	A	14	9	1.09	21	0.429
61	A	15	9	1.08	21	0.429
62	A	24	10	1.20	21	0.476
63	A	23	9	1.23	21	0.429
64	A	21	8	1.30	21	0.381
65	A	3	2	1.00	21	0.095
66	A	5	6	1.00	21	0.286
67	A	4	4	1.00	21	0.190
68	A	4	4	1.00	21	0.190
69	A	4	4	1.00	19	0.210
70	A	3	2	1.00	18	0.111
71	A	27	9	1.07	21	0.429
72	A	23	9	1.06	21	0.429
73	A	24	9	1.05	21	0.429
74	A	1	1	1.00	13	0.077
75	A	1	1	1.00	14	0.071
76	A	6	3	1.00	21	0.143
77	A	6	3	1.00	19	0.158
78	A	7	5	1.00	18	0.278
79	A	6	5	1.00	21	0.238
80	A	6	5	1.00	21	0.238
81	A	6	3	1.00	21	0.143
82	A	6	3	1.00	21	0.143
83	A	6	3	1.00	21	0.143
84	A	8	3	1.00	23	0.130
85	A	8	3	1.00	21	0.143
86	A	5	4	0.82	20	0.200
87	A	14	8	1.00	23	0.348
88	A	9	7	1.00	23	0.304
89	A	8	5	1.00	23	0.217
90	A	8	3	1.00	23	0.130
91	A	8	3	1.00	23	0.130
92	A	12	8	1.00	23	0.348

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
93	A	10	8	1.00	23	0.348
94	A	8	6	1.00	21	0.286
95	A	3	3	1.00	20	0.150
96	A	6	6	1.24	23	0.261
97	A	9	8	1.15	23	0.348
98	A	11	8	1.11	23	0.348
99	A	13	8	1.08	23	0.348
100	A	13	10	1.00	23	0.435
101	A	11	8	1.00	23	0.348
102	A	8	6	1.00	21	0.286
103	A	3	3	1.00	20	0.150
104	A	10	9	1.13	23	0.391
105	A	12	10	1.09	23	0.435
106	A	14	10	1.07	23	0.435
107	A	19	14	1.00	23	0.609
108	A	16	12	1.00	23	0.522
109	A	13	10	1.57	21	0.476
110	A	8	8	1.15	20	0.400
111	A	19	13	1.00	23	0.565
112	A	20	16	1.00	23	0.696
113	A	31	15	1.00	23	0.652
114	A	28	13	1.00	23	0.565
115	A	25	11	1.70	23	0.478
116	A	22	10	1.09	21	0.476
117	A	12	9	1.09	20	0.450
118	A	32	14	1.00	23	0.609
119	A	32	17	1.00	23	0.739
120	A	22	10	1.47	13	0.769
121	A	7	7	1.15	23	0.304
122	A	12	9	1.08	23	0.391
123	A	24	11	1.00	23	0.478
124	A	10	7	1.00	20	0.350
125	A	14	7	1.00	22	0.318
126	A	18	7	1.00	22	0.318
127	A	0	0	0.00	0	0.000
128	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
129	A	0	0	0.00	0	0.000
130	A	8	7	1.00	23	0.304
131	A	6	6	1.00	23	0.261
132	A	7	7	1.00	21	0.333
133	A	5	4	1.00	20	0.200
134	A	12	11	1.00	23	0.478
135	A	11	9	1.00	23	0.391
136	A	16	11	1.00	23	0.478
137	A	9	7	1.00	23	0.304
138	A	6	6	1.00	23	0.261
139	A	8	7	1.00	21	0.333
140	A	6	4	1.00	20	0.200
141	A	18	11	1.00	23	0.478
142	A	14	10	1.00	23	0.435
143	A	16	11	1.00	23	0.478
144	A	7	7	1.00	23	0.304
145	A	6	6	1.00	23	0.261
146	A	6	7	1.00	21	0.333
147	A	4	4	1.00	20	0.200
148	A	7	8	1.00	23	0.348
149	A	11	10	1.00	23	0.435
150	A	16	11	1.00	23	0.478
151	A	6	6	1.00	23	0.261
152	A	6	6	1.00	23	0.261
153	A	5	6	1.00	21	0.286
154	A	3	3	1.00	20	0.150
155	A	11	10	1.00	23	0.435
156	A	15	12	1.01	23	0.522
157	A	0	0	0.00	0	0.000
158	A	0	0	0.00	0	0.000
159	A	0	0	0.00	0	0.000
160	A	0	0	0.00	0	0.000
161	A	0	0	0.00	0	0.000
162	A	3	3	1.00	23	0.130
163	A	4	4	1.00	23	0.174
164	A	3	2	1.00	21	0.095

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
165	A	1	1	1.00	16	0.062
166	A	0	0	0.00	0	0.000
167	A	0	0	0.00	0	0.000
168	A	0	0	0.00	0	0.000
169	A	2	2	1.00	14	0.143
170	A	0	0	0.00	0	0.000
171	A	2	2	1.00	21	0.095
172	A	2	2	1.00	21	0.095
173	A	4	3	1.00	19	0.158
174	A	4	4	1.00	21	0.190
175	A	3	3	0.90	21	0.143
176	A	4	3	0.82	21	0.143
177	A	2	2	1.00	21	0.095
178	A	2	2	1.00	21	0.095
179	A	2	1	0.85	18	0.056
180	A	2	2	0.84	21	0.095
181	A	4	3	0.85	21	0.143
182	A	4	3	0.84	21	0.143
183	A	4	5	1.00	23	0.217
184	A	4	5	1.00	23	0.217
185	A	5	5	1.00	21	0.238
186	A	3	4	0.82	23	0.174
187	A	7	6	0.78	23	0.261
188	A	5	5	0.81	23	0.217
189	A	2	2	1.00	23	0.087
190	A	2	2	1.00	23	0.087
191	A	2	2	0.79	20	0.100
192	A	2	2	0.80	23	0.087
193	A	2	2	0.79	23	0.087
194	A	4	4	0.79	23	0.174
195	A	4	4	0.78	23	0.174
196	A	4	5	1.00	23	0.217
197	A	6	6	1.00	23	0.261
198	A	5	5	1.00	21	0.238
199	A	5	5	0.77	23	0.217
200	A	7	6	0.76	23	0.261

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
201	A	7	6	0.76	23	0.261
202	A	2	2	1.00	23	0.087
203	A	2	2	1.00	23	0.087
204	A	2	2	0.78	20	0.100
205	A	2	2	0.78	23	0.087
206	A	3	3	0.75	23	0.130
207	A	2	2	0.77	23	0.087
208	A	4	4	0.77	23	0.174
209	A	4	4	0.75	23	0.174
210	A	6	6	1.00	23	0.261
211	A	5	6	1.00	23	0.261
212	A	2	2	1.00	21	0.095
213	A	2	2	1.00	23	0.087
214	A	6	7	1.31	23	0.304
215	A	7	7	1.23	23	0.304
216	A	10	9	1.00	23	0.391
217	A	9	8	1.00	23	0.348
218	A	5	5	1.00	20	0.250
219	A	8	8	1.00	23	0.348
220	A	9	8	1.00	23	0.348
221	A	7	8	1.00	23	0.348
222	A	6	7	1.00	23	0.304
223	A	2	2	1.00	21	0.095
224	A	3	3	1.00	23	0.130
225	A	7	8	1.26	23	0.348
226	A	16	10	1.00	23	0.435
227	A	14	8	1.00	23	0.348
228	A	7	6	1.00	20	0.300
229	A	9	9	1.00	23	0.391
230	A	10	9	1.00	23	0.391
231	A	10	9	1.00	23	0.391
232	A	4	3	1.00	23	0.130
233	A	4	3	1.00	21	0.143
234	A	4	3	1.00	23	0.130
235	A	8	8	1.20	23	0.348
236	A	24	9	1.00	23	0.391

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
237	A	19	9	1.00	23	0.391
238	A	10	7	1.00	20	0.350
239	A	10	9	1.00	23	0.391
240	A	11	9	1.00	23	0.391
241	A	2	2	1.00	18	0.111
242	A	2	2	1.00	19	0.105
243	A	2	3	1.00	12	0.250
244	A	4	4	1.00	10	0.400
245	A	3	4	1.00	19	0.210
246	A	3	4	1.00	21	0.190
247	A	16	6	1.00	22	0.273
248	A	20	6	1.00	22	0.273
249	A	0	0	0.00	0	0.000
250	A	0	0	0.00	0	0.000
251	A	7	8	1.00	25	0.320
252	A	8	9	1.00	25	0.360
253	A	6	5	1.00	23	0.217
254	A	12	9	1.00	25	0.360
255	A	14	11	1.00	25	0.440
256	A	19	13	1.00	25	0.520
257	A	11	12	1.00	25	0.480
258	A	11	11	1.00	22	0.500
259	A	11	10	1.00	25	0.400
260	A	5	4	1.00	25	0.160
261	A	7	8	1.00	25	0.320
262	A	8	9	1.00	25	0.360
263	A	7	8	1.00	25	0.320
264	A	9	9	1.00	25	0.360
265	A	7	5	1.00	23	0.217
266	A	17	9	1.00	25	0.360
267	A	18	12	1.00	25	0.480
268	A	19	13	1.00	25	0.520
269	A	16	11	1.00	22	0.500
270	A	14	12	1.00	25	0.480
271	A	11	10	1.00	25	0.400
272	A	6	4	1.00	25	0.160

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
273	A	8	8	1.00	25	0.320
274	A	9	9	1.00	25	0.360
275	A	6	5	1.00	13	0.385
276	A	7	8	1.00	25	0.320
277	A	7	9	1.00	25	0.360
278	A	5	5	1.00	23	0.217
279	A	8	9	1.00	25	0.360
280	A	14	12	1.00	25	0.480
281	A	12	12	1.00	25	0.480
282	A	7	7	1.00	22	0.318
283	A	4	4	1.00	25	0.160
284	A	6	8	1.00	25	0.320
285	A	7	9	1.00	25	0.360
286	A	7	8	1.00	25	0.320
287	A	7	8	1.00	25	0.320
288	A	6	8	1.00	25	0.320
289	A	4	4	1.00	23	0.174
290	A	11	9	1.00	25	0.360
291	A	12	11	1.00	25	0.440
292	A	11	11	1.00	25	0.440
293	A	3	3	1.00	22	0.136
294	A	5	7	1.00	25	0.280
295	A	6	8	1.00	25	0.320
296	A	8	10	1.00	25	0.400
297	A	9	8	1.00	25	0.320
298	A	7	8	1.00	25	0.320
299	A	6	8	1.00	25	0.320
300	A	5	5	1.00	23	0.217
301	A	15	9	1.00	25	0.360
302	A	13	13	1.01	25	0.520
303	A	12	13	1.00	25	0.520
304	A	11	11	1.00	25	0.440
305	A	4	4	1.00	25	0.160
306	A	5	5	1.00	22	0.227
307	A	6	9	1.00	25	0.360
308	A	7	10	1.00	25	0.400

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
309	A	8	10	1.00	33	0.303
310	A	6	6	1.00	31	0.194
311	A	8	9	1.00	33	0.273
312	A	13	11	1.00	33	0.333
313	A	12	12	1.00	33	0.364
314	A	7	7	1.00	30	0.233
315	A	4	4	1.00	33	0.121
316	A	6	8	1.00	33	0.242
317	A	5	5	1.00	13	0.385
318	A	3	3	1.00	25	0.120
319	A	4	4	1.00	25	0.160
320	A	3	2	1.00	23	0.087
321	A	1	1	1.00	16	0.062
322	A	0	0	0.00	0	0.000
323	A	0	0	0.00	0	0.000
324	A	26	6	1.00	22	0.273
325	A	20	6	1.00	22	0.273
326	A	14	11	1.00	20	0.550
327	A	0	0	0.00	0	0.000
328	A	0	0	0.00	0	0.000
329	A	9	7	1.00	23	0.304
330	A	8	7	1.00	23	0.304
331	A	7	7	1.00	21	0.333
332	A	6	6	1.00	20	0.300
333	A	3	3	1.00	23	0.130
334	A	2	2	1.00	23	0.087
335	A	6	7	1.00	23	0.304
336	A	7	7	1.00	23	0.304
337	A	9	7	1.00	21	0.333
338	A	8	7	1.00	21	0.333
339	A	7	7	1.00	19	0.368
340	A	6	6	1.00	18	0.333
341	A	3	3	1.00	21	0.143
342	A	2	2	1.00	21	0.095
343	A	6	7	1.00	21	0.333
344	A	7	7	1.00	21	0.333

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
345	A	2	2	1.00	22	0.091
346	A	2	2	1.00	23	0.087
347	A	2	2	1.00	25	0.080
348	A	4	4	1.00	18	0.222
349	A	4	4	1.00	18	0.222
350	A	3	3	1.00	22	0.136
351	A	5	4	1.00	27	0.148
352	A	5	4	1.00	27	0.148
353	A	5	4	1.26	25	0.160
354	A	1	1	1.00	18	0.056
355	A	3	3	1.00	27	0.111
356	A	3	3	1.00	27	0.111
357	A	5	4	1.00	27	0.148
358	A	5	4	1.00	27	0.148
359	A	7	7	0.79	29	0.241
360	A	7	8	0.82	29	0.276
361	A	7	8	0.86	27	0.296
362	A	2	2	1.00	20	0.100
363	A	4	4	1.00	29	0.138
364	A	4	4	1.00	29	0.138
365	A	7	7	1.00	29	0.241
366	A	12	9	1.00	29	0.310
367	A	4	3	1.00	21	0.143
368	A	4	3	1.00	21	0.143
369	A	4	3	1.00	19	0.158
370	A	4	4	1.00	21	0.190
371	A	2	2	0.89	21	0.095
372	A	2	2	0.89	21	0.095
373	A	4	3	1.00	21	0.143
374	A	4	3	1.00	21	0.143
375	A	3	2	0.86	18	0.111
376	A	4	3	0.87	21	0.143
377	A	2	2	0.89	21	0.095
378	A	2	2	0.89	21	0.095
379	A	4	4	1.00	23	0.174
380	A	4	4	1.00	23	0.174

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
381	A	4	4	1.00	21	0.190
382	A	5	6	0.84	23	0.261
383	A	4	4	0.84	23	0.174
384	A	4	4	0.85	23	0.174
385	A	4	4	1.00	23	0.174
386	A	4	4	1.00	23	0.174
387	A	2	2	0.84	20	0.100
388	A	3	3	0.85	23	0.130
389	A	4	4	0.86	23	0.174
390	A	4	4	0.86	23	0.174
391	A	4	4	0.86	23	0.174
392	A	4	4	1.00	23	0.174
393	A	4	4	1.00	23	0.174
394	A	4	4	1.00	21	0.190
395	A	5	6	0.82	23	0.261
396	A	4	4	0.84	23	0.174
397	A	4	4	0.84	23	0.174
398	A	4	4	1.00	23	0.174
399	A	4	4	1.00	23	0.174
400	A	2	2	0.83	20	0.100
401	A	3	3	0.84	23	0.130
402	A	4	4	0.84	23	0.174
403	A	4	4	0.85	23	0.174
404	A	4	4	0.85	23	0.174
405	A	4	4	0.84	23	0.174
406	A	0	0	0.00	0	0.000
407	A	0	0	0.00	0	0.000
408	A	2	2	1.00	23	0.087
409	A	0	0	0.00	0	0.000
410	A	0	0	0.00	0	0.000
411	A	0	0	0.00	0	0.000
412	A	0	0	0.00	0	0.000
413	A	0	0	0.00	0	0.000
414	A	0	0	0.00	0	0.000
415	A	5	5	1.00	23	0.217
416	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
417	A	0	0	0.00	0	0.000
418	A	0	0	0.00	0	0.000
419	A	0	0	0.00	0	0.000
420	A	4	4	1.00	25	0.160
421	A	5	6	0.82	23	0.261
422	A	5	6	0.84	23	0.261
423	A	4	4	1.00	21	0.190
424	A	2	2	1.00	23	0.087
425	A	5	5	1.00	23	0.217
426	A	10	8	1.00	23	0.348
427	A	10	5	1.00	25	0.200
428	A	8	5	1.00	25	0.200
429	A	6	5	1.00	23	0.217
430	A	3	3	1.00	25	0.120
431	A	7	6	1.00	25	0.240
432	A	14	8	1.00	25	0.320
433	A	23	9	1.00	25	0.360
434	A	17	9	1.00	25	0.360
435	A	12	9	1.00	25	0.360
436	A	8	9	1.00	25	0.360
437	A	11	9	1.00	25	0.360
438	A	15	9	1.00	25	0.360
439	A	20	9	1.00	25	0.360
440	A	9	5	1.00	25	0.200
441	A	7	5	1.00	25	0.200
442	A	5	4	1.00	23	0.174
443	A	1	1	1.00	16	0.062
444	A	0	0	0.00	0	0.000
445	A	0	0	0.00	0	0.000
446	A	3	3	1.00	26	0.115
447	A	3	3	1.00	32	0.094
448	A	13	4	1.00	27	0.148
449	A	10	4	1.00	27	0.148
450	A	7	4	1.00	25	0.160
451	A	2	2	1.00	18	0.111
452	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
453	A	0	0	0.00	0	0.000
454	A	7	5	1.31	23	0.217
455	A	13	10	1.38	25	0.400
456	A	17	11	1.38	25	0.440

Chapter 3

Listing of integrals

3.1 $\int x^3(d+ex)\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=48

$$\frac{1}{20}\left(5dx^4+4ex^5\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bdnx^4-\frac{1}{25}benx^5$$

```
[Out] -1/16*b*d*n*x^4-1/25*b*e*n*x^5+1/20*(4*e*x^5+5*d*x^4)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.05, antiderivative size = 48, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {43, 2334, 12}

$$\frac{1}{20}\left(5dx^4+4ex^5\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bdnx^4-\frac{1}{25}benx^5$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^4)/16 - (b*e*n*x^5)/25 + ((5*d*x^4 + 4*e*x^5)*(a + b*Log[c*x^n]))
/20
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int x^3(d+ex)\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{20}\left(5dx^4+4ex^5\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{20}x^3(5d+4ex)\,dx\\ &= \frac{1}{20}\left(5dx^4+4ex^5\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{20}(bn)\int x^3(5d+4ex)\,dx\\ &= \frac{1}{20}\left(5dx^4+4ex^5\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{20}(bn)\int\left(5dx^3+4ex^4\right)\,dx\\ &= -\frac{1}{16}bdnx^4-\frac{1}{25}benx^5+\frac{1}{20}\left(5dx^4+4ex^5\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.04, size = 48, normalized size = 1.00

$$\frac{1}{400}x^4\left(20a(5d+4ex)+20b(5d+4ex)\log\left(cx^n\right)-bn(25d+16ex)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(20*a*(5*d + 4*e*x) - b*n*(25*d + 16*e*x) + 20*b*(5*d + 4*e*x)*Log[c*x
^n]))/400
```

fricas [A] time = 0.44, size = 69, normalized size = 1.44

$$-\frac{1}{25}\,(ben-5\,ae)x^5-\frac{1}{16}\,(bdn-4\,ad)x^4+\frac{1}{20}\left(4\,bex^5+5\,bdx^4\right)\log(c)+\frac{1}{20}\left(4\,benx^5+5\,bdnx^4\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*(b*e*n - 5*a*e)*x^5 - 1/16*(b*d*n - 4*a*d)*x^4 + 1/20*(4*b*e*x^5 + 5*
b*d*x^4)*log(c) + 1/20*(4*b*e*n*x^5 + 5*b*d*n*x^4)*log(x)
```

giac [A] time = 0.30, size = 73, normalized size = 1.52

$$\frac{1}{5}\,bnx^5e\log(x)-\frac{1}{25}\,bnx^5e+\frac{1}{5}\,bx^5e\log(c)+\frac{1}{4}\,bdnx^4\log(x)-\frac{1}{16}\,bdnx^4+\frac{1}{5}\,ax^5e+\frac{1}{4}\,bdx^4\log(c)+\frac{1}{4}\,adx^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*b*n*x^5*e*log(x) - 1/25*b*n*x^5*e + 1/5*b*x^5*e*log(c) + 1/4*b*d*n*x^4*
log(x) - 1/16*b*d*n*x^4 + 1/5*a*x^5*e + 1/4*b*d*x^4*log(c) + 1/4*a*d*x^4
```

maple [C] time = 0.21, size = 264, normalized size = 5.50

$$-\frac{i\pi be\,x^5\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{10}+\frac{i\pi be\,x^5\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{10}+\frac{i\pi be\,x^5\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{10}-\frac{i\pi be\,x^5}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/20*b*x^4*(4*e*x+5*d)*ln(x^n)+1/10*I*Pi*b*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)^
2-1/10*I*Pi*b*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/10*I*Pi*b*e*x^5*c
sgn(I*c*x^n)^3+1/10*I*Pi*b*e*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/5*ln(c)*b*e*x^
5-1/25*b*e*n*x^5+1/5*a*e*x^5+1/8*I*Pi*b*d*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-1
/8*I*Pi*b*d*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/8*I*Pi*b*d*x^4*csgn(I
*c*x^n)^3+1/8*I*Pi*b*d*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*ln(c)*b*d*x^4-1/16
*b*d*n*x^4+1/4*a*d*x^4
```

maximा [A] time = 0.57, size = 57, normalized size = 1.19

$$-\frac{1}{25}\,benx^5+\frac{1}{5}\,bex^5\log\left(cx^n\right)-\frac{1}{16}\,bdnx^4+\frac{1}{5}\,aex^5+\frac{1}{4}\,bdx^4\log\left(cx^n\right)+\frac{1}{4}\,adx^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*b*e*n*x^5 + 1/5*b*e*x^5*log(c*x^n) - 1/16*b*d*n*x^4 + 1/5*a*e*x^5 + 1
/4*b*d*x^4*log(c*x^n) + 1/4*a*d*x^4
```

mupad [B] time = 3.64, size = 51, normalized size = 1.06

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^5}{5}+\frac{b\,d\,x^4}{4}\right)+\frac{d\,x^4\,\left(4\,a-b\,n\right)}{16}+\frac{e\,x^5\,\left(5\,a-b\,n\right)}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*log(c*x^n))*(d + e*x),x)
```

```
[Out] log(c*x^n)*((b*d*x^4)/4 + (b*e*x^5)/5) + (d*x^4*(4*a - b*n))/16 + (e*x^5*(5
*a - b*n))/25
```

sympy [B] time = 2.29, size = 87, normalized size = 1.81

$$\frac{adx^4}{4}+\frac{aex^5}{5}+\frac{bdnx^4\log\left(x\right)}{4}-\frac{bdnx^4}{16}+\frac{bdx^4\log\left(c\right)}{4}+\frac{benx^5\log\left(x\right)}{5}-\frac{benx^5}{25}+\frac{bex^5\log\left(c\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**4/4 + a*e*x**5/5 + b*d*n*x**4*log(x)/4 - b*d*n*x**4/16 + b*d*x**4*lo
g(c)/4 + b*e*n*x**5*log(x)/5 - b*e*n*x**5/25 + b*e*x**5*log(c)/5
```

3.2 $\int x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=48

$$\frac{1}{12}\left(4dx^3+3ex^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bdnx^3-\frac{1}{16}benx^4$$

```
[Out] -1/9*b*d*n*x^3-1/16*b*e*n*x^4+1/12*(3*e*x^4+4*d*x^3)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.05, antiderivative size = 48, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {43, 2334, 12}

$$\frac{1}{12}\left(4dx^3+3ex^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bdnx^3-\frac{1}{16}benx^4$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^3)/9 - (b*e*n*x^4)/16 + ((4*d*x^3 + 3*e*x^4)*(a + b*Log[c*x^n]))/
12
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)\,dx&=\frac{1}{12}\left(4dx^3+3ex^4\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{12}x^2(4d+3ex)\,dx\\&=\frac{1}{12}\left(4dx^3+3ex^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{12}(bn)\int x^2(4d+3ex)\,dx\\&=\frac{1}{12}\left(4dx^3+3ex^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{12}(bn)\int\left(4dx^2+3ex^3\right)\,dx\\&=-\frac{1}{9}bdnx^3-\frac{1}{16}benx^4+\frac{1}{12}\left(4dx^3+3ex^4\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.03, size = 45, normalized size = 0.94

$$\frac{1}{144}x^3\left(48ad+36aex+12b(4d+3ex)\log\left(cx^n\right)-16bdn-9benx\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^3*(48*a*d - 16*b*d*n + 36*a*e*x - 9*b*e*n*x + 12*b*(4*d + 3*e*x)*Log[c*x
^n]))/144
```

fricas [A] time = 0.49, size = 69, normalized size = 1.44

$$-\frac{1}{16}(ben-4ae)x^4-\frac{1}{9}(bdn-3ad)x^3+\frac{1}{12}\left(3bex^4+4bdx^3\right)\log(c)+\frac{1}{12}\left(3benx^4+4bdnx^3\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*(b*e*n - 4*a*e)*x^4 - 1/9*(b*d*n - 3*a*d)*x^3 + 1/12*(3*b*e*x^4 + 4*b
*d*x^3)*log(c) + 1/12*(3*b*e*n*x^4 + 4*b*d*n*x^3)*log(x)
```

giac [A] time = 0.36, size = 73, normalized size = 1.52

$$\frac{1}{4}bnx^4e\log(x)-\frac{1}{16}bnx^4e+\frac{1}{4}bx^4e\log(c)+\frac{1}{3}bdnx^3\log(x)-\frac{1}{9}bdnx^3+\frac{1}{4}ax^4e+\frac{1}{3}bdx^3\log(c)+\frac{1}{3}adx^3$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b*n*x^4*e*log(x) - 1/16*b*n*x^4*e + 1/4*b*x^4*e*log(c) + 1/3*b*d*n*x^3*
log(x) - 1/9*b*d*n*x^3 + 1/4*a*x^4*e + 1/3*b*d*x^3*log(c) + 1/3*a*d*x^3
```

maple [C] time = 0.21, size = 264, normalized size = 5.50

$$-\frac{i\pi be\,x^4\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{8}+\frac{i\pi be\,x^4\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{8}+\frac{i\pi be\,x^4\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{8}-\frac{i\pi be}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/12*b*x^3*(3*e*x+4*d)*ln(x^n)+1/8*I*Pi*b*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2
-1/8*I*Pi*b*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/8*I*Pi*b*e*x^4*csgn
(I*c*x^n)^3+1/8*I*Pi*b*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*ln(c)*b*e*x^4-1/
16*b*e*n*x^4+1/4*a*e*x^4+1/6*I*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1/6*I
*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I*Pi*b*d*x^3*csgn(I*c*x
^n)^3+1/6*I*Pi*b*d*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*ln(c)*b*d*x^3-1/9*b*d*
n*x^3+1/3*a*d*x^3
```

maxima [A] time = 0.51, size = 57, normalized size = 1.19

$$-\frac{1}{16}benx^4+\frac{1}{4}bex^4\log\left(cx^n\right)-\frac{1}{9}bdnx^3+\frac{1}{4}aex^4+\frac{1}{3}bdx^3\log\left(cx^n\right)+\frac{1}{3}adx^3$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*b*e*n*x^4 + 1/4*b*e*x^4*log(c*x^n) - 1/9*b*d*n*x^3 + 1/4*a*e*x^4 + 1/
3*b*d*x^3*log(c*x^n) + 1/3*a*d*x^3
```

mupad [B] time = 3.59, size = 51, normalized size = 1.06

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^4}{4}+\frac{b\,d\,x^3}{3}\right)+\frac{d\,x^3\,\left(3\,a-b\,n\right)}{9}+\frac{e\,x^4\,\left(4\,a-b\,n\right)}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*log(c*x^n))*(d + e*x),x)
```

```
[Out] log(c*x^n)*((b*d*x^3)/3 + (b*e*x^4)/4) + (d*x^3*(3*a - b*n))/9 + (e*x^4*(4*
a - b*n))/16
```

sympy [B] time = 1.46, size = 87, normalized size = 1.81

$$\frac{adx^3}{3} + \frac{aex^4}{4} + \frac{bdnx^3\log(x)}{3} - \frac{bdnx^3}{9} + \frac{bdx^3\log(c)}{3} + \frac{benx^4\log(x)}{4} - \frac{benx^4}{16} + \frac{bex^4\log(c)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**3/3 + a*e*x**4/4 + b*d*n*x**3*log(x)/3 - b*d*n*x**3/9 + b*d*x**3*log
(c)/3 + b*e*n*x**4*log(x)/4 - b*e*n*x**4/16 + b*e*x**4*log(c)/4
```

3.3 $\int x(d+ex)\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=48

$$\frac{1}{6}\left(3dx^2+2ex^3\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bdnx^2-\frac{1}{9}benx^3$$

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

Rubi [A] time = 0.04, antiderivative size = 48, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {43, 2334, 12}

$$\frac{1}{6}\left(3dx^2+2ex^3\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bdnx^2-\frac{1}{9}benx^3$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^2)/4 - (b*e*n*x^3)/9 + ((3*d*x^2 + 2*e*x^3)*(a + b*Log[c*x^n]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int x(d+ex)\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{6}\left(3dx^2+2ex^3\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{6}x(3d+2ex)\,dx\\
&= \frac{1}{6}\left(3dx^2+2ex^3\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{6}(bn)\int x(3d+2ex)\,dx\\
&= \frac{1}{6}\left(3dx^2+2ex^3\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{6}(bn)\int\left(3dx+2ex^2\right)\,dx\\
&= -\frac{1}{4}bdnx^2-\frac{1}{9}benx^3+\frac{1}{6}\left(3dx^2+2ex^3\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.02, size = 48, normalized size = 1.00

$$\frac{1}{36}x^2\left(6a(3d+2ex)+6b(3d+2ex)\log\left(cx^n\right)-bn(9d+4ex)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(6*a*(3*d + 2*e*x) - b*n*(9*d + 4*e*x) + 6*b*(3*d + 2*e*x)*Log[c*x^n])
)/36
```

fricas [A] time = 0.43, size = 69, normalized size = 1.44

$$-\frac{1}{9}\,(ben-3\,ae)x^3-\frac{1}{4}\,(bdn-2\,ad)x^2+\frac{1}{6}\left(2\,bex^3+3\,bdx^2\right)\log(c)+\frac{1}{6}\left(2\,benx^3+3\,bdnx^2\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [A] time = 0.31, size = 73, normalized size = 1.52

$$\frac{1}{3}\,bnx^3e\log(x)-\frac{1}{9}\,bnx^3e+\frac{1}{3}\,bx^3e\log(c)+\frac{1}{2}\,bdnx^2\log(x)-\frac{1}{4}\,bdnx^2+\frac{1}{3}\,ax^3e+\frac{1}{2}\,bdx^2\log(c)+\frac{1}{2}\,adx^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*b*n*x^3*e*log(x) - 1/9*b*n*x^3*e + 1/3*b*x^3*e*log(c) + 1/2*b*d*n*x^2*l
og(x) - 1/4*b*d*n*x^2 + 1/3*a*x^3*e + 1/2*b*d*x^2*log(c) + 1/2*a*d*x^2
```

maple [C] time = 0.22, size = 264, normalized size = 5.50

$$-\frac{i\pi be\,x^3\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{6}+\frac{i\pi be\,x^3\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{6}+\frac{i\pi be\,x^3\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{6}-\frac{i\pi be\,x^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/6*b*x^2*(2*e*x+3*d)*ln(x^n)+1/6*I*Pi*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-
1/6*I*Pi*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I*Pi*b*e*x^3*csgn(
I*c*x^n)^3+1/6*I*Pi*b*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*ln(c)*b*e*x^3-1/9
*b*e*n*x^3+1/3*a*e*x^3+1/4*I*Pi*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*P
i*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4*I*Pi*b*d*x^2*csgn(I*c*x^n
)^3+1/4*I*Pi*b*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/2*ln(c)*b*d*x^2-1/4*b*d*n*
x^2+1/2*a*d*x^2
```

maxima [A] time = 0.51, size = 57, normalized size = 1.19

$$-\frac{1}{9}\,benx^3+\frac{1}{3}\,bex^3\log\left(cx^n\right)-\frac{1}{4}\,bdnx^2+\frac{1}{3}\,aex^3+\frac{1}{2}\,bdx^2\log\left(cx^n\right)+\frac{1}{2}\,adx^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 3.63, size = 51, normalized size = 1.06

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^3}{3}+\frac{b\,d\,x^2}{2}\right)+\frac{d\,x^2\,\left(2\,a-b\,n\right)}{4}+\frac{e\,x^3\,\left(3\,a-b\,n\right)}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*log(c*x^n))*(d + e*x),x)
```

```
[Out] log(c*x^n)*((b*d*x^2)/2 + (b*e*x^3)/3) + (d*x^2*(2*a - b*n))/4 + (e*x^3*(3*
a - b*n))/9
```

sympy [B] time = 0.87, size = 87, normalized size = 1.81

$$\frac{adx^2}{2}+\frac{aex^3}{3}+\frac{bdnx^2\log(x)}{2}-\frac{bdnx^2}{4}+\frac{bdx^2\log(c)}{2}+\frac{benx^3\log(x)}{3}-\frac{benx^3}{9}+\frac{bex^3\log(c)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**2/2 + a*e*x**3/3 + b*d*n*x**2*log(x)/2 - b*d*n*x**2/4 + b*d*x**2*log
(c)/2 + b*e*n*x**3*log(x)/3 - b*e*n*x**3/9 + b*e*x**3*log(c)/3
```

3.4 $\int (d+ex)\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=48

$$dx\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}ex^2\left(a+b\log\left(cx^n\right)\right)-bdnx-\frac{1}{4}benx^2$$

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

Rubi [A] time = 0.02, antiderivative size = 41, normalized size of antiderivative = 0.85, number of steps used = 2, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {2313}

$$\frac{1}{2}\left(2dx+ex^2\right)\left(a+b\log\left(cx^n\right)\right)-bdnx-\frac{1}{4}benx^2$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x) - (b*e*n*x^2)/4 + ((2*d*x + e*x^2)*(a + b*Log[c*x^n]))/2
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\begin{aligned}\int (d+ex)\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{2}\left(2dx+ex^2\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(d+\frac{ex}{2}\right)\,dx\\ &= -bdnx-\frac{1}{4}benx^2+\frac{1}{2}\left(2dx+ex^2\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 55, normalized size = 1.15

$$adx+\frac{1}{2}aex^2+bdx\log\left(cx^n\right)+\frac{1}{2}bex^2\log\left(cx^n\right)-bdnx-\frac{1}{4}benx^2$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] a*d*x - b*d*n*x + (a*e*x^2)/2 - (b*e*n*x^2)/4 + b*d*x*Log[c*x^n] + (b*e*x^2
*Log[c*x^n])/2
```

fricas [A] time = 0.43, size = 61, normalized size = 1.27

$$-\frac{1}{4}\left(ben-2\,ae\right)x^2-\left(bdn-ad\right)x+\frac{1}{2}\left(bex^2+2\,bdx\right)\log(c)+\frac{1}{2}\left(benx^2+2\,bdnx\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [A] time = 0.27, size = 62, normalized size = 1.29

$$\frac{1}{2}\,bnx^2e\log(x) - \frac{1}{4}\,bnx^2e + \frac{1}{2}\,bx^2e\log(c) + bdnx\log(x) - bdnx + \frac{1}{2}\,ax^2e + bdx\log(c) + adx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 0.06, size = 52, normalized size = 1.08

$$-\frac{ben\,x^2}{4} + \frac{be\,x^2\ln\left(c\,e^{n\ln(x)}\right)}{2} + \frac{ae\,x^2}{2} - bdnx + bdx\ln\left(c\,x^n\right) + adx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(b*ln(c*x^n)+a),x)
```

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

maxima [A] time = 0.73, size = 49, normalized size = 1.02

$$-\frac{1}{4}\,benx^2 + \frac{1}{2}\,bex^2\log\left(cx^n\right) - bdnx + \frac{1}{2}\,aex^2 + bdx\log\left(cx^n\right) + adx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 3.61, size = 43, normalized size = 0.90

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^2}{2}+b\,d\,x\right)+d\,x\,\left(a-b\,n\right)+\frac{e\,x^2\,\left(2\,a-b\,n\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))*(d + e*x),x)
```

```
[Out] log(c*x^n)*(b*d*x + (b*e*x^2)/2) + d*x*(a - b*n) + (e*x^2*(2*a - b*n))/4
```

sympy [A] time = 0.51, size = 73, normalized size = 1.52

$$adx + \frac{aex^2}{2} + bdnx\log\left(x\right) - bdnx + bdx\log\left(c\right) + \frac{benx^2\log\left(x\right)}{2} - \frac{benx^2}{4} + \frac{bex^2\log\left(c\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x + a*e*x**2/2 + b*d*n*x*log(x) - b*d*n*x + b*d*x*log(c) + b*e*n*x**2*l
og(x)/2 - b*e*n*x**2/4 + b*e*x**2*log(c)/2
```

3.5 $\int \frac{(d+ex)\left(a+b\log(cx^n)\right)}{x}\,dx$

Optimal. Leaf size=44

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+aex+bex\log\left(cx^n\right)-benx$$

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

Rubi [A] time = 0.05, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2346, 2301, 2295}

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+aex+bex\log\left(cx^n\right)-benx$$

Antiderivative was successfully verified.

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

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

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2346

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[((d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p)/x,
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rubi steps

$$\begin{aligned}
\int \frac{(d+ex)\left(a+b\log\left(cx^n\right)\right)}{x}\,dx &= d\int \frac{a+b\log\left(cx^n\right)}{x}\,dx+e\int \left(a+b\log\left(cx^n\right)\right)\,dx\\
&= aex+\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+(be)\int \log\left(cx^n\right)\,dx\\
&= aex-benx+bex\log\left(cx^n\right)+\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}
\end{aligned}$$

Mathematica [A] time = 0.00, size = 43, normalized size = 0.98

$$ad\log(x)+aex+\frac{bd\log^2\left(cx^n\right)}{2n}+bex\log\left(cx^n\right)-benx$$

Antiderivative was successfully verified.

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

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

fricas [A] time = 0.42, size = 45, normalized size = 1.02

$$\frac{1}{2}\,bdn\log(x)^2 + bex\log(c) - (ben - ae)x + \left(benx + bd\log(c) + ad\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [A] time = 0.23, size = 49, normalized size = 1.11

$$bnxe\log(x) + \frac{1}{2}\,bdn\log(x)^2 - bnxe + bxe\log(c) + bd\log(c)\log(x) + axe + ad\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 0.06, size = 46, normalized size = 1.05

$$-benx + bex\ln\left(c\,\mathrm{e}^{n\ln(x)}\right) + ad\ln(x) + aex + \frac{bd\ln\left(c\,\mathrm{e}^{n\ln(x)}\right)^2}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(b*ln(c*x^n)+a)/x,x)
```

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

maxima [A] time = 0.74, size = 41, normalized size = 0.93

$$-benx + bex\log\left(cx^n\right) + aex + \frac{bd\log\left(cx^n\right)^2}{2\,n} + ad\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 3.59, size = 40, normalized size = 0.91

$$a\,d\,\ln(x) + e\,x\,\left(a - b\,n\right) + b\,e\,x\,\ln\left(c\,x^n\right) + \frac{b\,d\ln\left(c\,x^n\right)^2}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x))/x,x)
```

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

sympy [A] time = 0.51, size = 58, normalized size = 1.32

$$ad\log\left(x\right) + aex + \frac{bdn\log\left(x\right)^2}{2} + bd\log\left(c\right)\log\left(x\right) + benx\log\left(x\right) - benx + bex\log\left(c\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.6 $\int \frac{(d+ex)\left(a+b\log(cx^n)\right)}{x^2}\,dx$

Optimal. Leaf size=48

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2bn}-\frac{bdn}{x}$$

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

Rubi [A] time = 0.05, antiderivative size = 43, normalized size of antiderivative = 0.90, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {43, 2334, 14, 2301}

$$-\left(\frac{d}{x}-e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{x}-\frac{1}{2}ben\log^2(x)$$

Antiderivative was successfully verified.

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

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

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx = -\left(\frac{d}{x}-e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-d+ex\log(x)}{x^2}\,dx$$
$$= -\left(\frac{d}{x}-e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \left(-\frac{d}{x^2}+\frac{e\log(x)}{x}\right)dx$$
$$= -\frac{bdn}{x}-\left(\frac{d}{x}-e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(ben)\int \frac{\log(x)}{x}\,dx$$
$$= -\frac{bdn}{x}-\frac{1}{2}ben\log^2(x)-\left(\frac{d}{x}-e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)$$

Mathematica [A] time = 0.03, size = 48, normalized size = 1.00

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2bn}-\frac{bdn}{x}$$

Antiderivative was successfully verified.

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

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

fricas [A] time = 0.47, size = 50, normalized size = 1.04

$$\frac{benx\log(x)^2-2\,bdn-2\,bd\log(c)-2\,ad+2\left(bex\log(c)-bdn+aex\right)\log(x)}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [A] time = 0.33, size = 56, normalized size = 1.17

$$\frac{bnxe\log(x)^2+2\,bxe\log(c)\log(x)-2\,bdn\log(x)+2\,axe\log(x)-2\,bdn-2\,bd\log(c)-2\,ad}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.24, size = 250, normalized size = 5.21

$$-\frac{(-ex\ln(x)+d)\,b\ln\left(x^n\right)}{x}-\frac{i\pi bex\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln(x)-i\pi bex\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2\ln(x)-i\pi be}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*(-e*x*ln(x)+d)/x*ln(x^n)-1/2*(-I*ln(x)*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^
2*x+I*ln(x)*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+I*ln(x)*Pi*b*e*csg
n(I*c*x^n)^3*x-I*ln(x)*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x+I*Pi*b*d*csgn(I*x
^n)*csgn(I*c*x^n)^2-I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d*c
```

```
sgn(I*c*x^n)^3+I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+b*e*n*ln(x)^2*x-2*ln(x)*l
n(c)*b*e*x-2*ln(x)*a*e*x+2*ln(c)*b*d+2*b*d*n+2*a*d)/x
```

maxima [A] time = 0.83, size = 49, normalized size = 1.02

$$\frac{be\log\left(cx^n\right)^2}{2n}+ae\log(x)-\frac{bdn}{x}-\frac{bd\log\left(cx^n\right)}{x}-\frac{ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 3.57, size = 59, normalized size = 1.23

$$\ln(x)\,\left(a\,e+b\,e\,n\right)-\frac{a\,d+b\,d\,n}{x}-\frac{\ln\left(c\,x^n\right)\,\left(b\,d+b\,e\,x\right)}{x}+\frac{b\,e\ln\left(c\,x^n\right)^2}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 4.98, size = 53, normalized size = 1.10

$$-\frac{ad}{x}+ae\log\left(x\right)+bd\left(-\frac{n}{x}-\frac{\log\left(cx^n\right)}{x}\right)-be\left(\begin{cases}-\log\left(c\right)\log\left(x\right) & \text{for}\ n=0\\ -\frac{\log\left(cx^n\right)^2}{2n} & \text{otherwise}\end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d/x + a*e*log(x) + b*d*(-n/x - log(c*x**n)/x) - b*e*Piecewise((-log(c)*l
og(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True))
```

3.7 $\int \frac{(d+ex)\left(a+b\log(cx^n)\right)}{x^3}\,dx$

Optimal. Leaf size=60

$$-\frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{2dx^2}+\frac{be^2n\log(x)}{2d}-\frac{bdn}{4x^2}-\frac{ben}{x}$$

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

Rubi [A] time = 0.05, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {37, 2334, 12, 43}

$$-\frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{2dx^2}+\frac{be^2n\log(x)}{2d}-\frac{bdn}{4x^2}-\frac{ben}{x}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d*n)/(4*x^2) - (b*e*n)/x + (b*e^2*n*Log[x])/(2*d) - ((d + e*x)^2*(a + b
*Log[c*x^n]))/(2*d*x^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

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

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx = -\frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{2dx^2} - (bn)\int -\frac{(d+ex)^2}{2dx^3}\,dx$$
$$= -\frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{2dx^2} + \frac{(bn)\int \frac{(d+ex)^2}{x^3}\,dx}{2d}$$
$$= -\frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{2dx^2} + \frac{(bn)\int \left(\frac{d^2}{x^3}+\frac{2de}{x^2}+\frac{e^2}{x}\right)dx}{2d}$$
$$= -\frac{bdn}{4x^2} - \frac{ben}{x} + \frac{be^2 n\log(x)}{2d} - \frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{2dx^2}$$

Mathematica [A] time = 0.02, size = 41, normalized size = 0.68

$$-\frac{2a(d+2ex)+2b(d+2ex)\log\left(cx^n\right)+bn(d+4ex)}{4x^2}$$

Antiderivative was successfully verified.

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

```
[Out] -1/4*(2*a*(d + 2*e*x) + b*n*(d + 4*e*x) + 2*b*(d + 2*e*x)*Log[c*x^n])/x^2
```

fricas [A] time = 0.46, size = 53, normalized size = 0.88

$$-\frac{bdn+2\,ad+4\,(ben+ae)x+2\,(2\,bex+bd)\log(c)+2\,(2\,benx+bdn)\log(x)}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [A] time = 0.32, size = 57, normalized size = 0.95

$$-\frac{4\,bnxe\log(x)+4\,bnxe+4\,bxe\log(c)+2\,bdn\log(x)+bdn+4\,axe+2\,bd\log(c)+2\,ad}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.15, size = 232, normalized size = 3.87

$$-\frac{(2ex+d)\,b\ln\left(x^n\right)}{2x^2}-\frac{-2i\pi bex\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)+2i\pi bex\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2+2i\pi bex\,\mathrm{csgn}\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b*(2*e*x+d)/x^2*ln(x^n)-1/4*(2*I*Pi*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-
2*I*Pi*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b*e*x*csgn(I*c*x^n)
^3+2*I*Pi*b*e*x*csgn(I*c*x^n)^2*csgn(I*c)+4*ln(c)*b*e*x+4*b*e*n*x+4*a*e*x+I
*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*csgn(I*c)*csgn(I*x^n)*csgn(I*c
```

```
*x^n)-I*Pi*b*d*csgn(I*c*x^n)^3+I*Pi*b*d*csgn(I*c)*csgn(I*c*x^n)^2+2*b*d*ln(
c)+b*d*n+2*a*d)/x^2
```

maxima [A] time = 0.64, size = 57, normalized size = 0.95

$$-\frac{ben}{x}-\frac{be\log\left(cx^{n}\right)}{x}-\frac{bdn}{4\,x^{2}}-\frac{ae}{x}-\frac{bd\log\left(cx^{n}\right)}{2\,x^{2}}-\frac{ad}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*e*n/x - b*e*log(c*x^n)/x - 1/4*b*d*n/x^2 - a*e/x - 1/2*b*d*log(c*x^n)/x^
2 - 1/2*a*d/x^2
```

mupad [B] time = 3.70, size = 47, normalized size = 0.78

$$-\frac{a\,d+x\,\left(2\,a\,e+2\,b\,e\,n\right)+\frac{b\,d\,n}{2}}{2\,x^2}-\frac{\ln\left(c\,x^n\right)\,\left(\frac{b\,d}{2}+b\,e\,x\right)}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 1.04, size = 75, normalized size = 1.25

$$-\frac{ad}{2x^{2}}-\frac{ae}{x}-\frac{bdn\log\left(x\right)}{2x^{2}}-\frac{bdn}{4x^{2}}-\frac{bd\log\left(c\right)}{2x^{2}}-\frac{ben\log\left(x\right)}{x}-\frac{ben}{x}-\frac{be\log\left(c\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d/(2*x**2) - a*e/x - b*d*n*log(x)/(2*x**2) - b*d*n/(4*x**2) - b*d*log(c)
/(2*x**2) - b*e*n*log(x)/x - b*e*n/x - b*e*log(c)/x
```

3.8 $\int \frac{(d+ex)\left(a+b\log(cx^n)\right)}{x^4}\,dx$

Optimal. Leaf size=57

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{bdn}{9x^3}-\frac{ben}{4x^2}$$

```
[Out] -1/9*b*d*n/x^3-1/4*b*e*n/x^2-1/3*d*(a+b*ln(c*x^n))/x^3-1/2*e*(a+b*ln(c*x^n)
)/x^2
```

Rubi [A] time = 0.04, antiderivative size = 48, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {43, 2334, 12}

$$-\frac{1}{6}\left(\frac{2d}{x^3}+\frac{3e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{9x^3}-\frac{ben}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d*n)/(9*x^3) - (b*e*n)/(4*x^2) - (((2*d)/x^3 + (3*e)/x^2)*(a + b*Log[c*
x^n]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int \frac{(d+ex)\left(a+b\log\left(cx^n\right)\right)}{x^4}\,dx &= -\frac{1}{6}\left(\frac{2d}{x^3}+\frac{3e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-2d-3ex}{6x^4}\,dx\\
&= -\frac{1}{6}\left(\frac{2d}{x^3}+\frac{3e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{6}(bn)\int \frac{-2d-3ex}{x^4}\,dx\\
&= -\frac{1}{6}\left(\frac{2d}{x^3}+\frac{3e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{6}(bn)\int \left(-\frac{2d}{x^4}-\frac{3e}{x^3}\right)dx\\
&= -\frac{bdn}{9x^3}-\frac{ben}{4x^2}-\frac{1}{6}\left(\frac{2d}{x^3}+\frac{3e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.03, size = 47, normalized size = 0.82

$$-\frac{6a(2d+3ex)+6b(2d+3ex)\log\left(cx^n\right)+bn(4d+9ex)}{36x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -1/36*(6*a*(2*d + 3*e*x) + b*n*(4*d + 9*e*x) + 6*b*(2*d + 3*e*x)*Log[c*x^n]
)/x^3
```

fricas [A] time = 0.44, size = 57, normalized size = 1.00

$$-\frac{4\,bdn+12\,ad+9\,(ben+2\,ae)x+6\,(3\,bex+2\,bd)\log(c)+6\,(3\,benx+2\,bdn)\log(x)}{36\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/36*(4*b*d*n + 12*a*d + 9*(b*e*n + 2*a*e)*x + 6*(3*b*e*x + 2*b*d)*log(c)
+ 6*(3*b*e*n*x + 2*b*d*n)*log(x))/x^3
```

giac [A] time = 0.26, size = 58, normalized size = 1.02

$$-\frac{18\,bnxe\log(x)+9\,bnxe+18\,bxe\log(c)+12\,bdn\log(x)+4\,bdn+18\,axe+12\,bd\log(c)+12\,ad}{36\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] -1/36*(18*b*n*x*e*log(x) + 9*b*n*x*e + 18*b*x*e*log(c) + 12*b*d*n*log(x) +
4*b*d*n + 18*a*x*e + 12*b*d*log(c) + 12*a*d)/x^3
```

maple [C] time = 0.16, size = 235, normalized size = 4.12

$$-\frac{(3ex+2d)\,b\ln\left(x^n\right)}{6x^3}-\frac{-9i\pi bex\operatorname{csgn}(ic)\operatorname{csgn}(ix^n)\operatorname{csgn}\left(ic\,x^n\right)+9i\pi bex\operatorname{csgn}(ic)\operatorname{csgn}\left(ic\,x^n\right)^2+9i\pi bex\operatorname{csgn}(ix}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(b*ln(c*x^n)+a)/x^4,x)
```

```
[Out] -1/6*b*(3*e*x+2*d)/x^3*ln(x^n)-1/36*(9*I*Pi*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)
^2-9*I*Pi*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi*b*e*x*csgn(I*c*x
^n)^3+9*I*Pi*b*e*x*csgn(I*c*x^n)^2*csgn(I*c)+18*b*e*x*ln(c)+9*b*e*n*x+18*a*
e*x+6*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-6*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)-6*I*Pi*b*d*csgn(I*c*x^n)^3+6*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I
*c)+12*b*d*ln(c)+4*b*d*n+12*a*d)/x^3
```

maxima [A] time = 0.61, size = 57, normalized size = 1.00

$$-\frac{ben}{4\,x^2}-\frac{be\log\left(cx^n\right)}{2\,x^2}-\frac{bdn}{9\,x^3}-\frac{ae}{2\,x^2}-\frac{bd\log\left(cx^n\right)}{3\,x^3}-\frac{ad}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] -1/4*b*e*n/x^2 - 1/2*b*e*log(c*x^n)/x^2 - 1/9*b*d*n/x^3 - 1/2*a*e/x^2 - 1/3
*b*d*log(c*x^n)/x^3 - 1/3*a*d/x^3
```

<u>**mupad**</u> **[B]** time = 3.47, size = 49, normalized size = 0.86

$$-\frac{2\,a\,d+x\,\left(3\,a\,e+\frac{3\,b\,e\,n}{2}\right)+\frac{2\,b\,d\,n}{3}}{6\,x^3}-\frac{\ln\left(c\,x^n\right)\,\left(\frac{b\,d}{3}+\frac{b\,e\,x}{2}\right)}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x))/x^4,x)
```

```
[Out] - (2*a*d + x*(3*a*e + (3*b*e*n)/2) + (2*b*d*n)/3)/(6*x^3) - (log(c*x^n)*((b
*d)/3 + (b*e*x)/2))/x^3
```

<u>**sympy**</u> **[A]** time = 1.64, size = 88, normalized size = 1.54

$$-\frac{ad}{3x^3}-\frac{ae}{2x^2}-\frac{bdn\log{(x)}}{3x^3}-\frac{bdn}{9x^3}-\frac{bd\log{(c)}}{3x^3}-\frac{ben\log{(x)}}{2x^2}-\frac{ben}{4x^2}-\frac{be\log{(c)}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d/(3*x**3) - a*e/(2*x**2) - b*d*n*log(x)/(3*x**3) - b*d*n/(9*x**3) - b*d
*log(c)/(3*x**3) - b*e*n*log(x)/(2*x**2) - b*e*n/(4*x**2) - b*e*log(c)/(2*x
**2)
```

3.9 $\int x^3(d+ex)^2\left(a+b\log\left(cx^n\right)\right)dx$

Optimal. Leaf size=74

$$\frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bd^2nx^4-\frac{2}{25}bdenx^5-\frac{1}{36}be^2nx^6$$

```
[Out] -1/16*b*d^2*n*x^4-2/25*b*d*e*n*x^5-1/36*b*e^2*n*x^6+1/60*(10*e^2*x^6+24*d*e
*x^5+15*d^2*x^4)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.09, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 2334, 12, 14}

$$\frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bd^2nx^4-\frac{2}{25}bdenx^5-\frac{1}{36}be^2nx^6$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^4)/16 - (2*b*d*e*n*x^5)/25 - (b*e^2*n*x^6)/36 + ((15*d^2*x^4 +
24*d*e*x^5 + 10*e^2*x^6)*(a + b*Log[c*x^n]))/60
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] && !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int x^3(d+ex)^2\left(a+b\log\left(cx^n\right)\right)dx &= \frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{60}x^3\left(15d^2+24\right.\\ &= \frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int x^3\left(15d^2+24\right.\\ &= \frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int\left(15d^2x^3+24\right.\\ &= -\frac{1}{16}bd^2nx^4-\frac{2}{25}bdenx^5-\frac{1}{36}be^2nx^6+\frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)\left(a+\right.\end{aligned}$$

Mathematica [A] time = 0.05, size = 81, normalized size = 1.09

$$\frac{x^4 \left(60 a \left(15 d^2+24 d e x+10 e^2 x^2\right)+60 b \left(15 d^2+24 d e x+10 e^2 x^2\right) \log \left(c x^n\right)-b n \left(225 d^2+288 d e x+100 e^2 x^2\right)\right)}{3600}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(60*a*(15*d^2 + 24*d*e*x + 10*e^2*x^2) - b*n*(225*d^2 + 288*d*e*x + 10
0*e^2*x^2) + 60*b*(15*d^2 + 24*d*e*x + 10*e^2*x^2)*Log[c*x^n]))/3600
```

fricas [A] time = 0.44, size = 118, normalized size = 1.59

$$-\frac{1}{36} \left(b e^2 n-6 a e^2\right) x^6-\frac{2}{25} (b d e n-5 a d e) x^5-\frac{1}{16} \left(b d^2 n-4 a d^2\right) x^4+\frac{1}{60} \left(10 b e^2 x^6+24 b d e x^5+15 b d^2 x^4\right) \log(c)+$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*(b*e^2*n - 6*a*e^2)*x^6 - 2/25*(b*d*e*n - 5*a*d*e)*x^5 - 1/16*(b*d^2*
n - 4*a*d^2)*x^4 + 1/60*(10*b*e^2*x^6 + 24*b*d*e*x^5 + 15*b*d^2*x^4)*log(c)
 + 1/60*(10*b*e^2*n*x^6 + 24*b*d*e*n*x^5 + 15*b*d^2*n*x^4)*log(x)
```

giac [A] time = 0.39, size = 123, normalized size = 1.66

$$\frac{1}{6} b n x^6 e^2 \log(x)+\frac{2}{5} b d n x^5 e \log(x)-\frac{1}{36} b n x^6 e^2-\frac{2}{25} b d n x^5 e+\frac{1}{6} b x^6 e^2 \log(c)+\frac{2}{5} b d x^5 e \log(c)+\frac{1}{4} b d^2 n x^4 \log(x)-\frac{1}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*b*n*x^6*e^2*log(x) + 2/5*b*d*n*x^5*e*log(x) - 1/36*b*n*x^6*e^2 - 2/25*b
*d*n*x^5*e + 1/6*b*x^6*e^2*log(c) + 2/5*b*d*x^5*e*log(c) + 1/4*b*d^2*n*x^4*
log(x) - 1/16*b*d^2*n*x^4 + 1/6*a*x^6*e^2 + 2/5*a*d*x^5*e + 1/4*b*d^2*x^4*l
og(c) + 1/4*a*d^2*x^4
```

maple [C] time = 0.22, size = 432, normalized size = 5.84

$$-\frac{i\pi b e^2 x^6 \operatorname{csgn}(ic) \operatorname{csgn}(ix^n) \operatorname{csgn}(ic x^n)}{12}+\frac{i\pi b e^2 x^6 \operatorname{csgn}(ic) \operatorname{csgn}(ic x^n)^2}{12}+\frac{i\pi b e^2 x^6 \operatorname{csgn}(ix^n) \operatorname{csgn}(ic x^n)^2}{12}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/60*b*x^4*(10*e^2*x^2+24*d*e*x+15*d^2)*ln(x^n)-1/5*I*Pi*b*d*e*x^5*csgn(I*c
*x^n)^3-1/12*I*Pi*b*e^2*x^6*csgn(I*c*x^n)^3-1/12*I*Pi*b*e^2*x^6*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)-1/8*I*Pi*b*d^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+1/6*ln(c)*b*e^2*x^6-1/36*b*e^2*n*x^6+1/6*a*e^2*x^6-1/5*I*Pi*b*d*e*x^5*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/12*I*Pi*b*e^2*x^6*csgn(I*c*x^n)^2*csg
n(I*c)+1/12*I*Pi*b*e^2*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+1/8*I*Pi*b*d^2*x^4*c
sgn(I*c*x^n)^2*csgn(I*c)+2/5*ln(c)*b*d*e*x^5-2/25*b*d*e*n*x^5+2/5*a*d*e*x^5
-1/8*I*Pi*b*d^2*x^4*csgn(I*c*x^n)^3+1/8*I*Pi*b*d^2*x^4*csgn(I*x^n)*csgn(I*c
*x^n)^2+1/5*I*Pi*b*d*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+1/5*I*Pi*b*d*e*x^5*c
sgn(I*c*x^n)^2*csgn(I*c)+1/4*ln(c)*b*d^2*x^4-1/16*b*d^2*n*x^4+1/4*a*d^2*x^4
```

maxima [A] time = 0.67, size = 100, normalized size = 1.35

$$-\frac{1}{36} b e^2 n x^6+\frac{1}{6} b e^2 x^6 \log \left(c x^n\right)-\frac{2}{25} b d e n x^5+\frac{1}{6} a e^2 x^6+\frac{2}{5} b d e x^5 \log \left(c x^n\right)-\frac{1}{16} b d^2 n x^4+\frac{2}{5} a d e x^5+\frac{1}{4} b d^2 x^4 \log \left(c x^n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*b*e^2*n*x^6 + 1/6*b*e^2*x^6*log(c*x^n) - 2/25*b*d*e*n*x^5 + 1/6*a*e^2
*x^6 + 2/5*b*d*e*x^5*log(c*x^n) - 1/16*b*d^2*n*x^4 + 2/5*a*d*e*x^5 + 1/4*b*
d^2*x^4*log(c*x^n) + 1/4*a*d^2*x^4
```

mupad [B] time = 3.69, size = 82, normalized size = 1.11

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^2\,x^4}{4}+\frac{2\,b\,d\,e\,x^5}{5}+\frac{b\,e^2\,x^6}{6}\right)+\frac{d^2\,x^4\,\left(4\,a-b\,n\right)}{16}+\frac{e^2\,x^6\,\left(6\,a-b\,n\right)}{36}+\frac{2\,d\,e\,x^5\,\left(5\,a-b\,n\right)}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*log(c*x^n))*(d + e*x)^2,x)
```

```
[Out] log(c*x^n)*((b*d^2*x^4)/4 + (b*e^2*x^6)/6 + (2*b*d*e*x^5)/5) + (d^2*x^4*(4*
a - b*n))/16 + (e^2*x^6*(6*a - b*n))/36 + (2*d*e*x^5*(5*a - b*n))/25
```

sympy [B] time = 3.92, size = 158, normalized size = 2.14

$$\frac{ad^2x^4}{4}+\frac{2adex^5}{5}+\frac{ae^2x^6}{6}+\frac{bd^2nx^4\log\left(x\right)}{4}-\frac{bd^2nx^4}{16}+\frac{bd^2x^4\log\left(c\right)}{4}+\frac{2bdenx^5\log\left(x\right)}{5}-\frac{2bdenx^5}{25}+\frac{2bdex^5\log\left(c\right)}{5}+\frac{be^2n}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**4/4 + 2*a*d*e*x**5/5 + a*e**2*x**6/6 + b*d**2*n*x**4*log(x)/4 - b
*d**2*n*x**4/16 + b*d**2*x**4*log(c)/4 + 2*b*d*e*n*x**5*log(x)/5 - 2*b*d*e*
n*x**5/25 + 2*b*d*e*x**5*log(c)/5 + b*e**2*n*x**6*log(x)/6 - b*e**2*n*x**6/
36 + b*e**2*x**6*log(c)/6
```

3.10 $\int x^2(d+ex)^2 \left(a+b\log \left(cx^n\right)\right) \, dx$

Optimal. Leaf size=74

$$\frac{1}{30} \left(10d^2x^3+15dex^4+6e^2x^5\right) \left(a+b\log \left(cx^n\right)\right)-\frac{1}{9}bd^2nx^3-\frac{1}{8}bdenx^4-\frac{1}{25}be^2nx^5$$

```
[Out] -1/9*b*d^2*n*x^3-1/8*b*d*e*n*x^4-1/25*b*e^2*n*x^5+1/30*(6*e^2*x^5+15*d*e*x^
4+10*d^2*x^3)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.08, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 2334, 12, 14}

$$\frac{1}{30} \left(10d^2x^3+15dex^4+6e^2x^5\right) \left(a+b\log \left(cx^n\right)\right)-\frac{1}{9}bd^2nx^3-\frac{1}{8}bdenx^4-\frac{1}{25}be^2nx^5$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^3)/9 - (b*d*e*n*x^4)/8 - (b*e^2*n*x^5)/25 + ((10*d^2*x^3 + 15*d
*e*x^4 + 6*e^2*x^5)*(a + b*Log[c*x^n]))/30
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int x^2(d+ex)^2 \left(a+b\log \left(cx^n\right)\right) \, dx &= \frac{1}{30} \left(10d^2x^3+15dex^4+6e^2x^5\right) \left(a+b\log \left(cx^n\right)\right)-(bn) \int \frac{1}{30}x^2 \left(10d^2+1\right.\\
&= \frac{1}{30} \left(10d^2x^3+15dex^4+6e^2x^5\right) \left(a+b\log \left(cx^n\right)\right)-\frac{1}{30}(bn) \int x^2 \left(10d^2+1\right.\\
&= \frac{1}{30} \left(10d^2x^3+15dex^4+6e^2x^5\right) \left(a+b\log \left(cx^n\right)\right)-\frac{1}{30}(bn) \int \left(10d^2x^2+15\right.\\
&= -\frac{1}{9}bd^2nx^3-\frac{1}{8}bdenx^4-\frac{1}{25}be^2nx^5+\frac{1}{30} \left(10d^2x^3+15dex^4+6e^2x^5\right) \left(a+\right.
\end{aligned}$$

Mathematica [A] time = 0.04, size = 81, normalized size = 1.09

$$\frac{x^3\left(60a\left(10d^2+15dex+6e^2x^2\right)+60b\left(10d^2+15dex+6e^2x^2\right)\log\left(cx^n\right)-bn\left(200d^2+225dex+72e^2x^2\right)\right)}{1800}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^3*(60*a*(10*d^2 + 15*d*e*x + 6*e^2*x^2) - b*n*(200*d^2 + 225*d*e*x + 72*
e^2*x^2) + 60*b*(10*d^2 + 15*d*e*x + 6*e^2*x^2)*Log[c*x^n]))/1800
```

fricas [A] time = 0.42, size = 118, normalized size = 1.59

$$-\frac{1}{25}\left(be^2n-5\,ae^2\right)x^5-\frac{1}{8}\left(bden-4\,ade\right)x^4-\frac{1}{9}\left(bd^2n-3\,ad^2\right)x^3+\frac{1}{30}\left(6\,be^2x^5+15\,bdex^4+10\,bd^2x^3\right)\log(c)+\frac{1}{30}\left(6\,b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*(b*e^2*n - 5*a*e^2)*x^5 - 1/8*(b*d*e*n - 4*a*d*e)*x^4 - 1/9*(b*d^2*n
- 3*a*d^2)*x^3 + 1/30*(6*b*e^2*x^5 + 15*b*d*e*x^4 + 10*b*d^2*x^3)*log(c) +
1/30*(6*b*e^2*n*x^5 + 15*b*d*e*n*x^4 + 10*b*d^2*n*x^3)*log(x)
```

giac [A] time = 0.26, size = 123, normalized size = 1.66

$$\frac{1}{5}\,bnx^5e^2\log(x)+\frac{1}{2}\,bdnx^4e\log(x)-\frac{1}{25}\,bnx^5e^2-\frac{1}{8}\,bdnx^4e+\frac{1}{5}\,bx^5e^2\log(c)+\frac{1}{2}\,bdx^4e\log(c)+\frac{1}{3}\,bd^2nx^3\log(x)-\frac{1}{9}\,bd^2n$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*b*n*x^5*e^2*log(x) + 1/2*b*d*n*x^4*e*log(x) - 1/25*b*n*x^5*e^2 - 1/8*b*
d*n*x^4*e + 1/5*b*x^5*e^2*log(c) + 1/2*b*d*x^4*e*log(c) + 1/3*b*d^2*n*x^3*l
og(x) - 1/9*b*d^2*n*x^3 + 1/5*a*x^5*e^2 + 1/2*a*d*x^4*e + 1/3*b*d^2*x^3*log
(c) + 1/3*a*d^2*x^3
```

maple [C] time = 0.22, size = 432, normalized size = 5.84

$$-\frac{i\pi b\,e^2x^5\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{10}+\frac{i\pi b\,e^2x^5\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{10}+\frac{i\pi b\,e^2x^5\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{10}-\frac{i\pi b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/30*b*x^3*(6*e^2*x^2+15*d*e*x+10*d^2)*ln(x^n)-1/6*I*Pi*b*d^2*x^3*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-1/4*I*Pi*b*d*e*x^4*csgn(I*c*x^n)^3+1/10*I*Pi*b*e
^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+1/6*I*Pi*b*d^2*x^3*csgn(I*x^n)*csgn(I*c*
x^n)^2+1/5*ln(c)*b*e^2*x^5-1/25*b*e^2*n*x^5+1/5*a*e^2*x^5-1/4*I*Pi*b*d*e*x^
4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi*b*d*e*x^4*csgn(I*x^n)*csgn(I
*c*x^n)^2+1/10*I*Pi*b*e^2*x^5*csgn(I*c*x^n)^2*csgn(I*c)-1/10*I*Pi*b*e^2*x^5
*csgn(I*c*x^n)^3+1/2*ln(c)*b*d*e*x^4-1/8*b*d*e*n*x^4+1/2*a*d*e*x^4+1/4*I*Pi
*b*d*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1/6*I*Pi*b*d^2*x^3*csgn(I*c*x^n)^3+1/6
*I*Pi*b*d^2*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/10*I*Pi*b*e^2*x^5*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+1/3*ln(c)*b*d^2*x^3-1/9*b*d^2*n*x^3+1/3*a*d^2*x^3
```

maxima [A] time = 0.60, size = 100, normalized size = 1.35

$$-\frac{1}{25}\,be^2nx^5+\frac{1}{5}\,be^2x^5\log\left(cx^n\right)-\frac{1}{8}\,bdenx^4+\frac{1}{5}\,ae^2x^5+\frac{1}{2}\,bdex^4\log\left(cx^n\right)-\frac{1}{9}\,bd^2nx^3+\frac{1}{2}\,adex^4+\frac{1}{3}\,bd^2x^3\log\left(cx^n\right)+\frac{1}{3}\,a$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*b*e^2*n*x^5 + 1/5*b*e^2*x^5*log(c*x^n) - 1/8*b*d*e*n*x^4 + 1/5*a*e^2*
x^5 + 1/2*b*d*e*x^4*log(c*x^n) - 1/9*b*d^2*n*x^3 + 1/2*a*d*e*x^4 + 1/3*b*d^
2*x^3*log(c*x^n) + 1/3*a*d^2*x^3
```

mupad [B] time = 3.49, size = 82, normalized size = 1.11

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^2\,x^3}{3}+\frac{b\,d\,e\,x^4}{2}+\frac{b\,e^2\,x^5}{5}\right)+\frac{d^2\,x^3\,\left(3\,a-b\,n\right)}{9}+\frac{e^2\,x^5\,\left(5\,a-b\,n\right)}{25}+\frac{d\,e\,x^4\,\left(4\,a-b\,n\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*log(c*x^n))*(d + e*x)^2,x)
```

```
[Out] log(c*x^n)*((b*d^2*x^3)/3 + (b*e^2*x^5)/5 + (b*d*e*x^4)/2) + (d^2*x^3*(3*a
- b*n))/9 + (e^2*x^5*(5*a - b*n))/25 + (d*e*x^4*(4*a - b*n))/8
```

sympy [B] time = 2.54, size = 151, normalized size = 2.04

$$\frac{ad^2x^3}{3}+\frac{adex^4}{2}+\frac{ae^2x^5}{5}+\frac{bd^2nx^3\log(x)}{3}-\frac{bd^2nx^3}{9}+\frac{bd^2x^3\log(c)}{3}+\frac{bdenx^4\log(x)}{2}-\frac{bdenx^4}{8}+\frac{bdex^4\log(c)}{2}+\frac{be^2nx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**3/3 + a*d*e*x**4/2 + a*e**2*x**5/5 + b*d**2*n*x**3*log(x)/3 - b*d
**2*n*x**3/9 + b*d**2*x**3*log(c)/3 + b*d*e*n*x**4*log(x)/2 - b*d*e*n*x**4/
8 + b*d*e*x**4*log(c)/2 + b*e**2*n*x**5*log(x)/5 - b*e**2*n*x**5/25 + b*e**
2*x**5*log(c)/5
```

3.11 $\int x(d+ex)^2 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=74

$$\frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bd^2nx^2-\frac{2}{9}bdenx^3-\frac{1}{16}be^2nx^4$$

```
[Out] -1/4*b*d^2*n*x^2-2/9*b*d*e*n*x^3-1/16*b*e^2*n*x^4+1/12*(3*e^2*x^4+8*d*e*x^3
+6*d^2*x^2)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.06, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {43, 2334, 12, 14}

$$\frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bd^2nx^2-\frac{2}{9}bdenx^3-\frac{1}{16}be^2nx^4$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^2)/4 - (2*b*d*e*n*x^3)/9 - (b*e^2*n*x^4)/16 + ((6*d^2*x^2 + 8*d
*e*x^3 + 3*e^2*x^4)*(a + b*Log[c*x^n]))/12
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int x(d+ex)^2\left(a+b\log\left(cx^n\right)\right)dx &= \frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{1}{12}x\left(6d^2+8dex+3e\right.\\ &= \frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{12}(bn)\int x\left(6d^2+8dex+3e\right.\\ &= \frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{12}(bn)\int\left(6d^2x+8dex^2+3e\right.\\ &= -\frac{1}{4}bd^2nx^2-\frac{2}{9}bdenx^3-\frac{1}{16}be^2nx^4+\frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)\left(a+b\log\left(\right.\right.\end{aligned}$$

Mathematica [A] time = 0.04, size = 81, normalized size = 1.09

$$\frac{1}{144}x^2\left(12a\left(6d^2+8dex+3e^2x^2\right)+12b\left(6d^2+8dex+3e^2x^2\right)\log\left(cx^n\right)-bn\left(36d^2+32dex+9e^2x^2\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(12*a*(6*d^2 + 8*d*e*x + 3*e^2*x^2) - b*n*(36*d^2 + 32*d*e*x + 9*e^2*x
^2) + 12*b*(6*d^2 + 8*d*e*x + 3*e^2*x^2)*Log[c*x^n]))/144
```

fricas [A] time = 0.55, size = 118, normalized size = 1.59

$$-\frac{1}{16}\left(be^2n-4\,ae^2\right)x^4-\frac{2}{9}\left(bden-3\,ade\right)x^3-\frac{1}{4}\left(bd^2n-2\,ad^2\right)x^2+\frac{1}{12}\left(3\,be^2x^4+8\,bdex^3+6\,bd^2x^2\right)\log(c)+\frac{1}{12}\left(3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*(b*e^2*n - 4*a*e^2)*x^4 - 2/9*(b*d*e*n - 3*a*d*e)*x^3 - 1/4*(b*d^2*n
- 2*a*d^2)*x^2 + 1/12*(3*b*e^2*x^4 + 8*b*d*e*x^3 + 6*b*d^2*x^2)*log(c) + 1/
12*(3*b*e^2*n*x^4 + 8*b*d*e*n*x^3 + 6*b*d^2*n*x^2)*log(x)
```

giac [A] time = 0.29, size = 123, normalized size = 1.66

$$\frac{1}{4}\,bnx^4e^2\log(x)+\frac{2}{3}\,bdnx^3e\log(x)-\frac{1}{16}\,bnx^4e^2-\frac{2}{9}\,bdnx^3e+\frac{1}{4}\,bx^4e^2\log(c)+\frac{2}{3}\,bdx^3e\log(c)+\frac{1}{2}\,bd^2nx^2\log(x)-\frac{1}{4}\,b$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b*n*x^4*e^2*log(x) + 2/3*b*d*n*x^3*e*log(x) - 1/16*b*n*x^4*e^2 - 2/9*b*
d*n*x^3*e + 1/4*b*x^4*e^2*log(c) + 2/3*b*d*x^3*e*log(c) + 1/2*b*d^2*n*x^2*l
og(x) - 1/4*b*d^2*n*x^2 + 1/4*a*x^4*e^2 + 2/3*a*d*x^3*e + 1/2*b*d^2*x^2*log
(c) + 1/2*a*d^2*x^2
```

maple [C] time = 0.23, size = 432, normalized size = 5.84

$$-\frac{i\pi b\,e^2x^4\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{8}+\frac{i\pi b\,e^2x^4\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{8}+\frac{i\pi b\,e^2x^4\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{8}-\frac{i}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/12*b*x^2*(3*e^2*x^2+8*d*e*x+6*d^2)*ln(x^n)-1/4*I*Pi*b*d^2*x^2*csgn(I*c*x^
n)^3-1/8*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4*I*Pi*b*d^2*
x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*I*Pi*b*d*e*x^3*csgn(I*c*x^n)^3+
1/4*ln(c)*b*e^2*x^4-1/16*b*e^2*n*x^4+1/4*a*e^2*x^4+1/3*I*Pi*b*d*e*x^3*csgn(
I*x^n)*csgn(I*c*x^n)^2+1/8*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*P
i*b*d^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/8*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I
*c*x^n)^2+2/3*ln(c)*b*d*e*x^3-2/9*b*d*e*n*x^3+2/3*a*d*e*x^3-1/8*I*Pi*b*e^2*
x^4*csgn(I*c*x^n)^3+1/3*I*Pi*b*d*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/3*I*Pi*b
*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi*b*d^2*x^2*csgn(I*x^n)
*csgn(I*c*x^n)^2+1/2*ln(c)*b*d^2*x^2-1/4*b*d^2*n*x^2+1/2*a*d^2*x^2
```

maxima [A] time = 0.76, size = 100, normalized size = 1.35

$$-\frac{1}{16}\,be^2nx^4+\frac{1}{4}\,be^2x^4\log\left(cx^n\right)-\frac{2}{9}\,bdenx^3+\frac{1}{4}\,ae^2x^4+\frac{2}{3}\,bdex^3\log\left(cx^n\right)-\frac{1}{4}\,bd^2nx^2+\frac{2}{3}\,adex^3+\frac{1}{2}\,bd^2x^2\log\left(cx^n\right)+$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*b*e^2*n*x^4 + 1/4*b*e^2*x^4*log(c*x^n) - 2/9*b*d*e*n*x^3 + 1/4*a*e^2*
x^4 + 2/3*b*d*e*x^3*log(c*x^n) - 1/4*b*d^2*n*x^2 + 2/3*a*d*e*x^3 + 1/2*b*d^
2*x^2*log(c*x^n) + 1/2*a*d^2*x^2
```

mupad [B] time = 3.63, size = 82, normalized size = 1.11

$$\ln(c\,x^n)\,\left(\frac{b\,d^2\,x^2}{2}+\frac{2\,b\,d\,e\,x^3}{3}+\frac{b\,e^2\,x^4}{4}\right)+\frac{d^2\,x^2\,\left(2\,a-b\,n\right)}{4}+\frac{e^2\,x^4\,\left(4\,a-b\,n\right)}{16}+\frac{2\,d\,e\,x^3\,\left(3\,a-b\,n\right)}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*log(c*x^n))*(d + e*x)^2,x)
```

```
[Out] log(c*x^n)*((b*d^2*x^2)/2 + (b*e^2*x^4)/4 + (2*b*d*e*x^3)/3) + (d^2*x^2*(2*
a - b*n))/4 + (e^2*x^4*(4*a - b*n))/16 + (2*d*e*x^3*(3*a - b*n))/9
```

sympy [B] time = 1.62, size = 158, normalized size = 2.14

$$\frac{ad^2x^2}{2}+\frac{2adex^3}{3}+\frac{ae^2x^4}{4}+\frac{bd^2nx^2\log(x)}{2}-\frac{bd^2nx^2}{4}+\frac{bd^2x^2\log(c)}{2}+\frac{2bdenx^3\log(x)}{3}-\frac{2bdenx^3}{9}+\frac{2bdex^3\log(c)}{3}+\frac{be^2n}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**2/2 + 2*a*d*e*x**3/3 + a*e**2*x**4/4 + b*d**2*n*x**2*log(x)/2 - b
*d**2*n*x**2/4 + b*d**2*x**2*log(c)/2 + 2*b*d*e*n*x**3*log(x)/3 - 2*b*d*e*n
*x**3/9 + 2*b*d*e*x**3*log(c)/3 + b*e**2*n*x**4*log(x)/4 - b*e**2*n*x**4/16
 + b*e**2*x**4*log(c)/4
```

3.12 $\int (d+ex)^2 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=70

$$\frac{(d+ex)^3 \left(a+b\log\left(cx^n\right)\right)}{3e}-\frac{bd^3n\log(x)}{3e}-bd^2nx-\frac{1}{2}bdenx^2-\frac{1}{9}be^2nx^3$$

```
[Out] -b*d^2*n*x-1/2*b*d*e*n*x^2-1/9*b*e^2*n*x^3-1/3*b*d^3*n*ln(x)/e+1/3*(e*x+d)^
3*(a+b*ln(c*x^n))/e
```

Rubi [A] time = 0.04, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {32, 2313, 12, 43}

$$\frac{(d+ex)^3 \left(a+b\log\left(cx^n\right)\right)}{3e}-\frac{bd^3n\log(x)}{3e}-bd^2nx-\frac{1}{2}bdenx^2-\frac{1}{9}be^2nx^3$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x) - (b*d*e*n*x^2)/2 - (b*e^2*n*x^3)/9 - (b*d^3*n*Log[x])/(3*e) +
 ((d + e*x)^3*(a + b*Log[c*x^n]))/(3*e)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 32

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

Rule 43

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

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$
\begin{aligned}
\int (d+ex)^2 \left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{3e} - (bn)\int \frac{(d+ex)^3}{3ex}\,dx \\
&= \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{3e} - \frac{(bn)\int \frac{(d+ex)^3}{x}\,dx}{3e} \\
&= \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{3e} - \frac{(bn)\int \left(3d^2e+\frac{d^3}{x}+3de^2x+e^3x^2\right)dx}{3e} \\
&= -bd^2nx - \frac{1}{2}bdenx^2 - \frac{1}{9}be^2nx^3 - \frac{bd^3n\log(x)}{3e} + \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{3e}
\end{aligned}
$$

Mathematica [A] time = 0.05, size = 77, normalized size = 1.10

$$
\frac{1}{18}x\left(6a\left(3d^2+3dex+e^2x^2\right)+6b\left(3d^2+3dex+e^2x^2\right)\log\left(cx^n\right)-bn\left(18d^2+9dex+2e^2x^2\right)\right)
$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x*(6*a*(3*d^2 + 3*d*e*x + e^2*x^2) - b*n*(18*d^2 + 9*d*e*x + 2*e^2*x^2) +
6*b*(3*d^2 + 3*d*e*x + e^2*x^2)*Log[c*x^n]))/18
```

fricas [A] time = 0.57, size = 110, normalized size = 1.57

$$
-\frac{1}{9}\left(be^2n-3\,ae^2\right)x^3-\frac{1}{2}\left(bden-2\,ade\right)x^2-\left(bd^2n-ad^2\right)x+\frac{1}{3}\left(be^2x^3+3\,bdex^2+3\,bd^2x\right)\log(c)+\frac{1}{3}\left(be^2nx^3+3\,bden
$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/9*(b*e^2*n - 3*a*e^2)*x^3 - 1/2*(b*d*e*n - 2*a*d*e)*x^2 - (b*d^2*n - a*d
^2)*x + 1/3*(b*e^2*x^3 + 3*b*d*e*x^2 + 3*b*d^2*x)*log(c) + 1/3*(b*e^2*n*x^3
 + 3*b*d*e*n*x^2 + 3*b*d^2*n*x)*log(x)
```

giac [A] time = 0.23, size = 109, normalized size = 1.56

$$
\frac{1}{3}\,bnx^3e^2\log(x)+bdnx^2e\log(x)-\frac{1}{9}\,bnx^3e^2-\frac{1}{2}\,bdnx^2e+\frac{1}{3}\,bx^3e^2\log(c)+bdx^2e\log(c)+bd^2nx\log(x)-bd^2nx+\frac{1}{3}\,ax^3e^2
$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*b*n*x^3*e^2*log(x) + b*d*n*x^2*e*log(x) - 1/9*b*n*x^3*e^2 - 1/2*b*d*n*x
^2*e + 1/3*b*x^3*e^2*log(c) + b*d*x^2*e*log(c) + b*d^2*n*x*log(x) - b*d^2*n
*x + 1/3*a*x^3*e^2 + a*d*x^2*e + b*d^2*x*log(c) + a*d^2*x
```

maple [C] time = 0.26, size = 414, normalized size = 5.91

$$
-\frac{i\pi b\,e^2x^3\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{6}+\frac{i\pi b\,e^2x^3\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{6}+\frac{i\pi b\,e^2x^3\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{6}-\frac{i\pi b
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/3*(e*x+d)^3*b/e*ln(x^n)+1/2*I*e*Pi*b*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/2*
I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x-1/6*I*e^2*Pi*b*x^3*csgn(I*c*x^n)^3
```

```
-1/2*I*e*Pi*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/6*I*e^2*Pi*b*x^3*
csgn(I*c*x^n)^2*csgn(I*c)+1/6*I*e^2*Pi*b*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/
2*I*e*Pi*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/6*I*e^2*Pi*b*x^3*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)+1/2*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)*x-1/2*I*P
i*b*d^2*csgn(I*c*x^n)^3*x-1/2*I*e*Pi*b*d*x^2*csgn(I*c*x^n)^3-1/2*I*Pi*b*d^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+1/3*ln(c)*b*e^2*x^3-1/9*b*e^2*n*x^3+
ln(c)*b*d*e*x^2+1/3*a*e^2*x^3-1/2*b*d*e*n*x^2-1/3*b*d^3*n*ln(x)/e+ln(c)*b*d
^2*x+a*d*e*x^2-b*d^2*n*x+a*d^2*x
```

maxima [A] time = 0.87, size = 90, normalized size = 1.29

$$-\frac{1}{9}be^2nx^3+\frac{1}{3}be^2x^3\log(cx^n)-\frac{1}{2}bdenx^2+\frac{1}{3}ae^2x^3+bdex^2\log(cx^n)-bd^2nx+adex^2+bd^2x\log(cx^n)+ad^2x$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/9*b*e^2*n*x^3 + 1/3*b*e^2*x^3*log(c*x^n) - 1/2*b*d*e*n*x^2 + 1/3*a*e^2*x
^3 + b*d*e*x^2*log(c*x^n) - b*d^2*n*x + a*d*e*x^2 + b*d^2*x*log(c*x^n) + a*
d^2*x
```

mupad [B] time = 3.61, size = 73, normalized size = 1.04

$$\ln(c\,x^n)\,\left(b\,d^2\,x+b\,d\,e\,x^2+\frac{b\,e^2\,x^3}{3}\right)+\frac{e^2\,x^3\,\left(3\,a-b\,n\right)}{9}+d^2\,x\,\left(a-b\,n\right)+\frac{d\,e\,x^2\,\left(2\,a-b\,n\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))*(d + e*x)^2,x)
```

```
[Out] log(c*x^n)*((b*e^2*x^3)/3 + b*d^2*x + b*d*e*x^2) + (e^2*x^3*(3*a - b*n))/9
+ d^2*x*(a - b*n) + (d*e*x^2*(2*a - b*n))/2
```

sympy [B] time = 0.98, size = 133, normalized size = 1.90

$$ad^2x+adex^2+\frac{ae^2x^3}{3}+bd^2nx\log(x)-bd^2nx+bd^2x\log(c)+bdenx^2\log(x)-\frac{bdenx^2}{2}+bdex^2\log(c)+\frac{be^2nx^3\log(x}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x + a*d*e*x**2 + a*e**2*x**3/3 + b*d**2*n*x*log(x) - b*d**2*n*x + b*
d**2*x*log(c) + b*d*e*n*x**2*log(x) - b*d*e*n*x**2/2 + b*d*e*x**2*log(c) +
b*e**2*n*x**3*log(x)/3 - b*e**2*n*x**3/9 + b*e**2*x**3*log(c)/3
```

3.13 $\int \frac{(d+ex)^2\left(a+b\log(cx^n)\right)}{x}\,dx$

Optimal. Leaf size=80

$$d^2\log(x)\left(a+b\log\left(cx^n\right)\right)+2dex\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}e^2x^2\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^2n\log^2(x)-\frac{1}{4}bn(4d+ex)^2$$

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

Rubi [A] time = 0.07, antiderivative size = 63, normalized size of antiderivative = 0.79, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {43, 2334, 2301}

$$\frac{1}{2}\left(2d^2\log(x)+4dex+e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^2n\log^2(x)-\frac{1}{4}bn(4d+ex)^2$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n*(4*d + e*x)^2)/4 - (b*d^2*n*Log[x]^2)/2 + ((4*d*e*x + e^2*x^2 + 2*d^2
*Log[x])*(a + b*Log[c*x^n]))/2
```

Rule 43

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{x}\,dx &= \frac{1}{2}\left(4dex+e^2x^2+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(\frac{1}{2}e(4d+ex)+\frac{d^2\log}{x}\right.\\ &= -\frac{1}{4}bn(4d+ex)^2+\frac{1}{2}\left(4dex+e^2x^2+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\left(bd^2n\right)\int\\ &= -\frac{1}{4}bn(4d+ex)^2-\frac{1}{2}bd^2n\log^2(x)+\frac{1}{2}\left(4dex+e^2x^2+2d^2\log(x)\right)\left(a+b\log(c\right.\end{aligned}$$

Mathematica [A] time = 0.05, size = 83, normalized size = 1.04

$$\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+\frac{1}{2}e^2x^2\left(a+b\log\left(cx^n\right)\right)+2adex+2bdex\log\left(cx^n\right)-2bdenx-\frac{1}{4}be^2nx^2$$

Antiderivative was successfully verified.

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

```
[Out] 2*a*d*e*x - 2*b*d*e*n*x - (b*e^2*n*x^2)/4 + 2*b*d*e*x*Log[c*x^n] + (e^2*x^2
*(a + b*Log[c*x^n]))/2 + (d^2*(a + b*Log[c*x^n])^2)/(2*b*n)
```

fricas [A] time = 0.61, size = 98, normalized size = 1.22

$$\frac{1}{2}bd^2n\log(x)^2 - \frac{1}{4}\left(be^2n - 2ae^2\right)x^2 - 2(bden - ade)x + \frac{1}{2}\left(be^2x^2 + 4bdex\right)\log(c) + \frac{1}{2}\left(be^2nx^2 + 4bdenx + 2bd^2\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [A] time = 0.28, size = 100, normalized size = 1.25

$$\frac{1}{2}bnx^2e^2\log(x) + 2bdnxe\log(x) + \frac{1}{2}bd^2n\log(x)^2 - \frac{1}{4}bnx^2e^2 - 2bdnxe + \frac{1}{2}bx^2e^2\log(c) + 2bdxe\log(c) + bd^2\log(c)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b*n*x^2*e^2*log(x) + 2*b*d*n*x*e*log(x) + 1/2*b*d^2*n*log(x)^2 - 1/4*b*
n*x^2*e^2 - 2*b*d*n*x*e + 1/2*b*x^2*e^2*log(c) + 2*b*d*x*e*log(c) + b*d^2*l
og(c)*log(x) + 1/2*a*x^2*e^2 + 2*a*d*x*e + a*d^2*log(x)
```

maple [C] time = 0.32, size = 410, normalized size = 5.12

$$-\frac{i\pi b\,e^2x^2\operatorname{csgn}(ic)\operatorname{csgn}(ix^n)\operatorname{csgn}(ic\,x^n)}{4} + \frac{i\pi b\,e^2x^2\operatorname{csgn}(ic)\operatorname{csgn}(ic\,x^n)^2}{4} + \frac{i\pi b\,e^2x^2\operatorname{csgn}(ix^n)\operatorname{csgn}(ic\,x^n)^2}{4} - $$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (1/2*b*e^2*x^2+2*b*d*e*x+b*d^2*ln(x))*ln(x^n)-1/2*b*d^2*n*ln(x)^2+1/4*I*Pi*
b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)-1/4*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi*b
*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*Pi*ln(x)*b*d^2*csgn(I*x^n)*csgn(
I*c*x^n)^2-1/2*I*Pi*ln(x)*b*d^2*csgn(I*c*x^n)^3-1/4*I*Pi*b*e^2*x^2*csgn(I*c
*x^n)^3-I*Pi*b*d*e*x*csgn(I*c*x^n)^3+1/2*ln(c)*b*e^2*x^2-1/4*b*e^2*n*x^2+2*
ln(c)*b*d*e*x+1/2*a*e^2*x^2-2*b*d*e*n*x+2*a*d*e*x-1/2*I*Pi*ln(x)*b*d^2*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*Pi*ln(x)*b*d^2*csgn(I*c*x^n)^2*csgn(I
*c)+I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*
c*x^n)^2+ln(c)*ln(x)*b*d^2+ln(x)*a*d^2
```

maxima [A] time = 0.60, size = 84, normalized size = 1.05

$$-\frac{1}{4}be^2nx^2 + \frac{1}{2}be^2x^2\log(cx^n) - 2bdenx + \frac{1}{2}ae^2x^2 + 2bdex\log(cx^n) + 2adex + \frac{bd^2\log(cx^n)^2}{2n} + ad^2\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 3.57, size = 75, normalized size = 0.94

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e^2\,x^2}{2}+2\,b\,d\,e\,x\right)+\frac{e^2\,x^2\,\left(2\,a-b\,n\right)}{4}+a\,d^2\,\ln(x)+\frac{b\,d^2\,{\ln\left(c\,x^n\right)}^2}{2\,n}+2\,d\,e\,x\,\left(a-b\,n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] log(c*x^n)*((b*e^2*x^2)/2 + 2*b*d*e*x) + (e^2*x^2*(2*a - b*n))/4 + a*d^2*lo
g(x) + (b*d^2*log(c*x^n)^2)/(2*n) + 2*d*e*x*(a - b*n)
```

sympy [A] time = 1.00, size = 128, normalized size = 1.60

$$ad^2\log(x)+2adex+\frac{ae^2x^2}{2}+\frac{bd^2n\log(x)^2}{2}+bd^2\log(c)\log(x)+2bdenx\log(x)-2bdenx+2bdex\log(c)+\frac{be^2nx^2\log}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**2*log(x) + 2*a*d*e*x + a*e**2*x**2/2 + b*d**2*n*log(x)**2/2 + b*d**2*l
og(c)*log(x) + 2*b*d*e*n*x*log(x) - 2*b*d*e*n*x + 2*b*d*e*x*log(c) + b*e**2
*n*x**2*log(x)/2 - b*e**2*n*x**2/4 + b*e**2*x**2*log(c)/2
```

3.14 $\int \frac{(d+ex)^2(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=78

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{x}+2de\log(x)\left(a+b\log\left(cx^n\right)\right)+e^2x\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{x}-bden\log^2(x)-be^2nx$$

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

Rubi [A] time = 0.08, antiderivative size = 61, normalized size of antiderivative = 0.78, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {43, 2334, 2301}

$$-\left(\frac{d^2}{x}-2de\log(x)-e^2x\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{x}-bden\log^2(x)-be^2nx$$

Antiderivative was successfully verified.

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

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

Rule 43

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx &= -\left(\frac{d^2}{x}-e^2x-2de\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(e^2-\frac{d^2}{x^2}+\frac{2de\log(x)}{x}\right.\\ &= -\frac{bd^2n}{x}-be^2nx-\left(\frac{d^2}{x}-e^2x-2de\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(2bden)\int\frac{\log\\ &= -\frac{bd^2n}{x}-be^2nx-bden\log^2(x)-\left(\frac{d^2}{x}-e^2x-2de\log(x)\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.06, size = 76, normalized size = 0.97

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{de\left(a+b\log\left(cx^n\right)\right)^2}{bn}+ae^2x+be^2x\log\left(cx^n\right)-\frac{bd^2n}{x}-be^2nx$$

Antiderivative was successfully verified.

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

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

fricas [A] time = 0.64, size = 98, normalized size = 1.26

$$\frac{bdenx\log(x)^2 - bd^2n - ad^2 - \left(be^2n - ae^2\right)x^2 + \left(be^2x^2 - bd^2\right)\log(c) + \left(be^2nx^2 + 2\,bdex\log(c) - bd^2n + 2\,adex\right)\mathrm{lo}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [A] time = 0.30, size = 101, normalized size = 1.29

$$\frac{bdnxe\log(x)^2 + bnx^2e^2\log(x) + 2\,bdxe\log(c)\log(x) - bnx^2e^2 + bx^2e^2\log(c) - bd^2n\log(x) + 2\,adxe\log(x) - bd^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.32, size = 419, normalized size = 5.37

$$-\frac{\left(-2dex\ln(x) - e^2x^2 + d^2\right)b\ln\left(x^n\right)}{x} - \frac{2i\pi bdex\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln(x) - 2i\pi bdex\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*(-2*d*e*x*ln(x)-e^2*x^2+d^2)/x*ln(x^n)-1/2*(-I*Pi*b*e^2*x^2*csgn(I*c*x^n
)^2*csgn(I*c)-I*Pi*b*d^2*csgn(I*c*x^n)^3-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d^2*csgn(I*x^n)*cs
gn(I*c*x^n)^2-2*I*ln(x)*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x+I*Pi*b*e^2*x^2
*csgn(I*c*x^n)^3-2*I*ln(x)*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x+2*I*ln(x)
*Pi*b*d*e*csgn(I*c*x^n)^3*x+2*I*ln(x)*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*x-I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*e^2*x^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+2*b*d*e*n*ln(x)^2*x-4*ln(x)*ln(c)*b*d*e*x-2*b*
e^2*x^2*ln(c)+2*b*e^2*n*x^2-4*ln(x)*a*d*e*x-2*a*e^2*x^2+2*ln(c)*b*d^2+2*b*d
^2*n+2*a*d^2)/x
```

maxima [A] time = 0.53, size = 83, normalized size = 1.06

$$-be^2nx + be^2x\log\left(cx^n\right) + ae^2x + \frac{bde\log\left(cx^n\right)^2}{n} + 2\,ade\log(x) - \frac{bd^2n}{x} - \frac{bd^2\log\left(cx^n\right)}{x} - \frac{ad^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 3.66, size = 99, normalized size = 1.27

$$\ln(x)\ (2\,a\,d\,e+2\,b\,d\,e\,n)-\frac{a\,d^2+b\,d^2\,n}{x}-\ln\left(c\,x^n\right)\,\left(\frac{b\,d^2+2\,b\,d\,e\,x+b\,e^2\,x^2}{x}-2\,b\,e^2\,x\right)+e^2\,x\ (a-b\,n)+\frac{b\,d\,e\ln\left(c\right.}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 1.01, size = 109, normalized size = 1.40

$$-\frac{ad^2}{x}+2ade\log\left(x\right)+ae^2x-\frac{bd^2n\log\left(x\right)}{x}-\frac{bd^2n}{x}-\frac{bd^2\log\left(c\right)}{x}+bden\log\left(x\right)^2+2bde\log\left(c\right)\log\left(x\right)+be^2nx\log\left(x\right)-$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.15 $\int \frac{(d+ex)^2(a+b\log(cx^n))}{x^3} dx$

Optimal. Leaf size=84

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{2de\left(a+b\log\left(cx^n\right)\right)}{x}+e^2\log(x)\left(a+b\log\left(cx^n\right)\right)-\frac{bn(d+4ex)^2}{4x^2}-\frac{1}{2}be^2n\log^2(x)$$

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

Rubi [A] time = 0.08, antiderivative size = 67, normalized size of antiderivative = 0.80, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 2334, 37, 2301}

$$-\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{4de}{x}-2e^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bn(d+4ex)^2}{4x^2}-\frac{1}{2}be^2n\log^2(x)$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n*(d + 4*e*x)^2)/(4*x^2) - (b*e^2*n*Log[x]^2)/2 - ((d^2/x^2 + (4*d*e)/x
 - 2*e^2*Log[x])*(a + b*Log[c*x^n]))/2
```

Rule 37

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

Rule 43

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)^2 \left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx = -\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{4de}{x}-2e^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(-\frac{d(d+4ex)}{2x^3}+\frac{e^2 1}{}\right.$$
$$=-\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{4de}{x}-2e^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}(bdn)\int\frac{d+4ex}{x^3}\,dx-\left(be\right.$$
$$=-\frac{bn(d+4ex)^2}{4x^2}-\frac{1}{2}be^2n\log^2(x)-\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{4de}{x}-2e^2\log(x)\right)\left(a+b\log\left(cx\right.\right.$$

Mathematica [A] time = 0.06, size = 84, normalized size = 1.00

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{2de\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{2bn}-\frac{bd^2n}{4x^2}-\frac{2bden}{x}$$

Antiderivative was successfully verified.

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

```
[Out] -1/4*(b*d^2*n)/x^2 - (2*b*d*e*n)/x - (d^2*(a + b*Log[c*x^n]))/(2*x^2) - (2*
d*e*(a + b*Log[c*x^n]))/x + (e^2*(a + b*Log[c*x^n])^2)/(2*b*n)
```

fricas [A] time = 0.51, size = 101, normalized size = 1.20

$$\frac{2\,be^2nx^2\log(x)^2-bd^2n-2\,ad^2-8\,(bden+ade)x-2\left(4\,bdex+bd^2\right)\log(c)+2\left(2\,be^2x^2\log(c)-4\,bdenx+2\,a\right.}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(2*b*e^2*n*x^2*log(x)^2 - b*d^2*n - 2*a*d^2 - 8*(b*d*e*n + a*d*e)*x - 2
*(4*b*d*e*x + b*d^2)*log(c) + 2*(2*b*e^2*x^2*log(c) - 4*b*d*e*n*x + 2*a*e^2
*x^2 - b*d^2*n)*log(x))/x^2
```

giac [A] time = 0.29, size = 105, normalized size = 1.25

$$\frac{2\,bnx^2e^2\log(x)^2-8\,bdnxe\log(x)+4\,bx^2e^2\log(c)\log(x)-8\,bdnxe-8\,bdxe\log(c)-2\,bd^2n\log(x)+4\,ax^2e^2\,l}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(2*b*n*x^2*e^2*log(x)^2 - 8*b*d*n*x*e*log(x) + 4*b*x^2*e^2*log(c)*log(x
) - 8*b*d*n*x*e - 8*b*d*x*e*log(c) - 2*b*d^2*n*log(x) + 4*a*x^2*e^2*log(x)
- b*d^2*n - 8*a*d*x*e - 2*b*d^2*log(c) - 2*a*d^2)/x^2
```

maple [C] time = 0.24, size = 418, normalized size = 4.98

$$-\frac{\left(-2e^2x^2\ln(x)+4dex+d^2\right)b\ln\left(x^n\right)}{2x^2}-\frac{2i\pi b\,e^2x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln(x)-2i\pi b\,e^2x^2\mathrm{csgn}\left(ic\right)\mathrm{csg}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b*(-2*e^2*ln(x)*x^2+4*d*e*x+d^2)/x^2*ln(x^n)-1/4*(I*Pi*b*d^2*csgn(I*c)
*csgn(I*c*x^n)^2+4*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*ln(x)*Pi*b*
e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^2+2*I*ln(x)*Pi*b*e^2*csgn(I*c*x^n)^3*x^2-
2*I*ln(x)*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*x^2+4*I*Pi*b*d*e*x*csgn(I*c*x^
```

```
n)^2*csgn(I*c)+2*I*ln(x)*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2-I
*Pi*b*d^2*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-4*I*Pi*b*d*e*x*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-4*I*Pi*b*d*e*x*csgn(I*c*x^n)^3+I*Pi*b*d^2*csgn(I*x^n)
*csgn(I*c*x^n)^2-I*Pi*b*d^2*csgn(I*c*x^n)^3+2*b*e^2*n*ln(x)^2*x^2-4*ln(x)*l
n(c)*b*e^2*x^2-4*ln(x)*a*e^2*x^2+8*b*d*e*x*ln(c)+8*b*d*e*n*x+2*b*d^2*ln(c)+
8*a*d*e*x+b*d^2*n+2*a*d^2)/x^2
```

maxima [A] time = 0.51, size = 90, normalized size = 1.07

$$\frac{be^2\log\left(cx^n\right)^2}{2n}+ae^2\log(x)-\frac{2\,bden}{x}-\frac{2\,bde\log\left(cx^n\right)}{x}-\frac{bd^2n}{4\,x^2}-\frac{2\,ade}{x}-\frac{bd^2\log\left(cx^n\right)}{2\,x^2}-\frac{ad^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 3.69, size = 99, normalized size = 1.18

$$\ln(x)\,\left(a\,e^2+\frac{3\,b\,e^2\,n}{2}\right)-\frac{a\,d^2+x\,\left(4\,a\,d\,e+4\,b\,d\,e\,n\right)+\frac{b\,d^2\,n}{2}}{2\,x^2}-\frac{\ln\left(c\,x^n\right)\,\left(\frac{b\,d^2}{2}+2\,b\,d\,e\,x+\frac{3\,b\,e^2\,x^2}{2}\right)}{x^2}+\frac{b\,e^2\,\ln\left(c\,x^n\right)^2}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] log(x)*(a*e^2 + (3*b*e^2*n)/2) - (a*d^2 + x*(4*a*d*e + 4*b*d*e*n) + (b*d^2*
n)/2)/(2*x^2) - (log(c*x^n)*((b*d^2)/2 + (3*b*e^2*x^2)/2 + 2*b*d*e*x))/x^2
+ (b*e^2*log(c*x^n)^2)/(2*n)
```

sympy [A] time = 6.47, size = 99, normalized size = 1.18

$$-\frac{ad^2}{2x^2}-\frac{2ade}{x}+ae^2\log(x)+bd^2\left(-\frac{n}{4x^2}-\frac{\log\left(cx^n\right)}{2x^2}\right)+2bde\left(-\frac{n}{x}-\frac{\log\left(cx^n\right)}{x}\right)-be^2\left(\begin{cases}-\log(c)\log(x) & \text{for}\ n=0\\ -\frac{\log\left(cx^n\right)^2}{2n} & \text{otherwise}\end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d**2/(2*x**2) - 2*a*d*e/x + a*e**2*log(x) + b*d**2*(-n/(4*x**2) - log(c*
x**n)/(2*x**2)) + 2*b*d*e*(-n/x - log(c*x**n)/x) - b*e**2*Piecewise((-log(c
)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True))
```

3.16 $\int \frac{(d+ex)^2(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=75

$$-\frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{3dx^3}-\frac{bd^2n}{9x^3}+\frac{be^3n\log(x)}{3d}-\frac{bden}{2x^2}-\frac{be^2n}{x}$$

```
[Out] -1/9*b*d^2*n/x^3-1/2*b*d*e*n/x^2-b*e^2*n/x+1/3*b*e^3*n*ln(x)/d-1/3*(e*x+d)^
3*(a+b*ln(c*x^n))/d/x^3
```

Rubi [A] time = 0.07, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {37, 2334, 12, 43}

$$-\frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{3dx^3}-\frac{bd^2n}{9x^3}+\frac{be^3n\log(x)}{3d}-\frac{bden}{2x^2}-\frac{be^2n}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^2*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^2*n)/(9*x^3) - (b*d*e*n)/(2*x^2) - (b*e^2*n)/x + (b*e^3*n*Log[x])/(3*
d) - ((d + e*x)^3*(a + b*Log[c*x^n]))/(3*d*x^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

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

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{x^4}\,dx = -\frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{3dx^3} - (bn)\int -\frac{(d+ex)^3}{3dx^4}\,dx$$
$$= -\frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{3dx^3} + \frac{(bn)\int \frac{(d+ex)^3}{x^4}\,dx}{3d}$$
$$= -\frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{3dx^3} + \frac{(bn)\int \left(\frac{d^3}{x^4}+\frac{3d^2e}{x^3}+\frac{3de^2}{x^2}+\frac{e^3}{x}\right)dx}{3d}$$
$$= -\frac{bd^2n}{9x^3} - \frac{bden}{2x^2} - \frac{be^2n}{x} + \frac{be^3n\log(x)}{3d} - \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{3dx^3}$$

Mathematica [A] time = 0.04, size = 76, normalized size = 1.01

$$-\frac{6a\left(d^2+3dex+3e^2x^2\right)+6b\left(d^2+3dex+3e^2x^2\right)\log\left(cx^n\right)+bn\left(2d^2+9dex+18e^2x^2\right)}{18x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^2*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -1/18*(6*a*(d^2 + 3*d*e*x + 3*e^2*x^2) + b*n*(2*d^2 + 9*d*e*x + 18*e^2*x^2)
 + 6*b*(d^2 + 3*d*e*x + 3*e^2*x^2)*Log[c*x^n])/x^3
```

fricas [A] time = 0.59, size = 103, normalized size = 1.37

$$-\frac{2\,bd^2n + 6\,ad^2 + 18\left(be^2n + ae^2\right)x^2 + 9\,(bden + 2\,ade)x + 6\left(3\,be^2x^2 + 3\,bdex + bd^2\right)\log(c) + 6\left(3\,be^2nx^2 + 3\,bde\right.}{18\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/18*(2*b*d^2*n + 6*a*d^2 + 18*(b*e^2*n + a*e^2)*x^2 + 9*(b*d*e*n + 2*a*d*
e)*x + 6*(3*b*e^2*x^2 + 3*b*d*e*x + b*d^2)*log(c) + 6*(3*b*e^2*n*x^2 + 3*b*
d*e*n*x + b*d^2*n)*log(x))/x^3
```

giac [A] time = 0.29, size = 108, normalized size = 1.44

$$-\frac{18\,bnx^2e^2\log(x) + 18\,bdnxe\log(x) + 18\,bnx^2e^2 + 9\,bdnxe + 18\,bx^2e^2\log(c) + 18\,bdxe\log(c) + 6\,bd^2n\log(x) + 2}{18\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] -1/18*(18*b*n*x^2*e^2*log(x) + 18*b*d*n*x*e*log(x) + 18*b*n*x^2*e^2 + 9*b*d
*n*x*e + 18*b*x^2*e^2*log(c) + 18*b*d*x*e*log(c) + 6*b*d^2*n*log(x) + 2*b*d
^2*n + 18*a*x^2*e^2 + 18*a*d*x*e + 6*b*d^2*log(c) + 6*a*d^2)/x^3
```

maple [C] time = 0.17, size = 401, normalized size = 5.35

$$-\frac{\left(3e^2x^2+3dex+d^2\right)b\ln\left(x^n\right)}{3x^3} - \frac{-9i\pi b\,e^2x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)+9i\pi b\,e^2x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2+9}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(b*ln(c*x^n)+a)/x^4,x)
```

```
[Out] -1/3*b*(3*e^2*x^2+3*d*e*x+d^2)/x^3*ln(x^n)-1/18*(-3*I*Pi*b*d^2*csgn(I*c*x^n
)^3-9*I*Pi*b*d*e*x*csgn(I*c*x^n)^3-9*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+9*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+18*b*e^2*x^2*ln(c
)+18*b*e^2*n*x^2+18*a*e^2*x^2+9*I*Pi*b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-3*
I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi*b*d*e*x*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+9*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+18*b*d*e*x*
ln(c)+9*b*d*e*n*x+18*a*d*e*x+9*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+3*I
*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-9*I*Pi*b*e^2*x^2*csgn(I*c*x^n)^3+3*I*
Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+6*b*d^2*ln(c)+2*b*d^2*n+6*a*d^2)/x^3
```

maxima [A] time = 0.60, size = 100, normalized size = 1.33

$$-\frac{be^2n}{x}-\frac{be^2\log(cx^n)}{x}-\frac{bden}{2\,x^2}-\frac{ae^2}{x}-\frac{bde\log(cx^n)}{x^2}-\frac{bd^2n}{9\,x^3}-\frac{ade}{x^2}-\frac{bd^2\log(cx^n)}{3\,x^3}-\frac{ad^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] -b*e^2*n/x - b*e^2*log(c*x^n)/x - 1/2*b*d*e*n/x^2 - a*e^2/x - b*d*e*log(c*x
^n)/x^2 - 1/9*b*d^2*n/x^3 - a*d*e/x^2 - 1/3*b*d^2*log(c*x^n)/x^3 - 1/3*a*d^
2/x^3
```

mupad [B] time = 3.59, size = 82, normalized size = 1.09

$$-\frac{x^2\left(3\,a\,e^2+3\,b\,e^2\,n\right)+a\,d^2+x\left(3\,a\,d\,e+\frac{3\,b\,d\,e\,n}{2}\right)+\frac{b\,d^2\,n}{3}}{3\,x^3}-\frac{\ln\left(c\,x^n\right)\left(\frac{b\,d^2}{3}+b\,d\,e\,x+b\,e^2\,x^2\right)}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^2)/x^4,x)
```

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

sympy [A] time = 1.82, size = 134, normalized size = 1.79

$$-\frac{ad^2}{3x^3}-\frac{ade}{x^2}-\frac{ae^2}{x}-\frac{bd^2n\log(x)}{3x^3}-\frac{bd^2n}{9x^3}-\frac{bd^2\log(c)}{3x^3}-\frac{bden\log(x)}{x^2}-\frac{bden}{2x^2}-\frac{bde\log(c)}{x^2}-\frac{be^2n\log(x)}{x}-\frac{be^2n}{x}-\frac{be^2\,\mathrm{lo}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d**2/(3*x**3) - a*d*e/x**2 - a*e**2/x - b*d**2*n*log(x)/(3*x**3) - b*d**
2*n/(9*x**3) - b*d**2*log(c)/(3*x**3) - b*d*e*n*log(x)/x**2 - b*d*e*n/(2*x*
*2) - b*d*e*log(c)/x**2 - b*e**2*n*log(x)/x - b*e**2*n/x - b*e**2*log(c)/x
```

3.17 $\int \frac{(d+ex)^2(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=95

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{2de\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{bd^2n}{16x^4}-\frac{2bden}{9x^3}-\frac{be^2n}{4x^2}$$

```
[Out] -1/16*b*d^2*n/x^4-2/9*b*d*e*n/x^3-1/4*b*e^2*n/x^2-1/4*d^2*(a+b*ln(c*x^n))/x
^4-2/3*d*e*(a+b*ln(c*x^n))/x^3-1/2*e^2*(a+b*ln(c*x^n))/x^2
```

Rubi [A] time = 0.08, antiderivative size = 74, normalized size of antiderivative = 0.78, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 2334, 12, 14}

$$-\frac{1}{12}\left(\frac{3d^2}{x^4}+\frac{8de}{x^3}+\frac{6e^2}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{16x^4}-\frac{2bden}{9x^3}-\frac{be^2n}{4x^2}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^2*n)/(16*x^4) - (2*b*d*e*n)/(9*x^3) - (b*e^2*n)/(4*x^2) - (((3*d^2)/x
^4 + (8*d*e)/x^3 + (6*e^2)/x^2)*(a + b*Log[c*x^n]))/12
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{x^5}\,dx = -\frac{1}{12}\left(\frac{3d^2}{x^4}+\frac{8de}{x^3}+\frac{6e^2}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-3d^2-8dex-6e^2x^2}{12x^5}\,dx$$
$$= -\frac{1}{12}\left(\frac{3d^2}{x^4}+\frac{8de}{x^3}+\frac{6e^2}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{12}(bn)\int \frac{-3d^2-8dex-6e^2x^2}{x^5}$$
$$= -\frac{1}{12}\left(\frac{3d^2}{x^4}+\frac{8de}{x^3}+\frac{6e^2}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{12}(bn)\int \left(-\frac{3d^2}{x^5}-\frac{8de}{x^4}-\frac{6e^2}{x^3}\right)$$
$$= -\frac{bd^2n}{16x^4}-\frac{2bden}{9x^3}-\frac{be^2n}{4x^2}-\frac{1}{12}\left(\frac{3d^2}{x^4}+\frac{8de}{x^3}+\frac{6e^2}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)$$

Mathematica [A] time = 0.04, size = 80, normalized size = 0.84

$$-\frac{12a\left(3d^2+8dex+6e^2x^2\right)+12b\left(3d^2+8dex+6e^2x^2\right)\log\left(cx^n\right)+bn\left(9d^2+32dex+36e^2x^2\right)}{144x^4}$$

Antiderivative was successfully verified.

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

```
[Out] -1/144*(12*a*(3*d^2 + 8*d*e*x + 6*e^2*x^2) + b*n*(9*d^2 + 32*d*e*x + 36*e^2
*x^2) + 12*b*(3*d^2 + 8*d*e*x + 6*e^2*x^2)*Log[c*x^n])/x^4
```

fricas [A] time = 0.72, size = 106, normalized size = 1.12

$$-\frac{9\,bd^2n+36\,ad^2+36\left(be^2n+2\,ae^2\right)x^2+32\,(bden+3\,ade)x+12\left(6\,be^2x^2+8\,bdex+3\,bd^2\right)\log(c)+12\left(6\,be^2\right.}{144\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/144*(9*b*d^2*n + 36*a*d^2 + 36*(b*e^2*n + 2*a*e^2)*x^2 + 32*(b*d*e*n + 3
*a*d*e)*x + 12*(6*b*e^2*x^2 + 8*b*d*e*x + 3*b*d^2)*log(c) + 12*(6*b*e^2*n*x
^2 + 8*b*d*e*n*x + 3*b*d^2*n)*log(x))/x^4
```

giac [A] time = 0.32, size = 108, normalized size = 1.14

$$-\frac{72\,bnx^2e^2\log(x)+96\,bdnxe\log(x)+36\,bnx^2e^2+32\,bdnxe+72\,bx^2e^2\log(c)+96\,bdxe\log(c)+36\,bd^2n\log}{144\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/144*(72*b*n*x^2*e^2*log(x) + 96*b*d*n*x*e*log(x) + 36*b*n*x^2*e^2 + 32*b
*d*n*x*e + 72*b*x^2*e^2*log(c) + 96*b*d*x*e*log(c) + 36*b*d^2*n*log(x) + 9*
b*d^2*n + 72*a*x^2*e^2 + 96*a*d*x*e + 36*b*d^2*log(c) + 36*a*d^2)/x^4
```

maple [C] time = 0.17, size = 403, normalized size = 4.24

$$-\frac{\left(6e^2x^2+8dex+3d^2\right)b\ln\left(x^n\right)}{12x^4}-\frac{-36i\pi b\,e^2x^2\operatorname{csgn}(ic)\operatorname{csgn}(ix^n)\operatorname{csgn}(ic\,x^n)+36i\pi b\,e^2x^2\operatorname{csgn}(ic)\operatorname{csgn}(ic\,x^n)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/12*b*(6*e^2*x^2+8*d*e*x+3*d^2)/x^4*ln(x^n)-1/144*(-48*I*Pi*b*d*e*x*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+48*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+48
```

```
*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+36*I*Pi*b*e^2*x^2*csgn(I*x^n)*csg
n(I*c*x^n)^2+72*b*e^2*x^2*ln(c)+36*b*e^2*n*x^2+72*a*e^2*x^2+18*I*Pi*b*d^2*c
sgn(I*c*x^n)^2*csgn(I*c)-18*I*Pi*b*d^2*csgn(I*c*x^n)^3-36*I*Pi*b*e^2*x^2*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+36*I*Pi*b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*
c)+96*b*d*e*x*ln(c)+32*b*d*e*n*x+96*a*d*e*x+18*I*Pi*b*d^2*csgn(I*x^n)*csgn(
I*c*x^n)^2-48*I*Pi*b*d*e*x*csgn(I*c*x^n)^3-18*I*Pi*b*d^2*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)-36*I*Pi*b*e^2*x^2*csgn(I*c*x^n)^3+36*b*d^2*ln(c)+9*b*d^2*
n+36*a*d^2)/x^4
```

maxima [A] time = 0.64, size = 100, normalized size = 1.05

$$-\frac{be^2n}{4x^2}-\frac{be^2\log\left(cx^n\right)}{2x^2}-\frac{2\,bden}{9x^3}-\frac{ae^2}{2x^2}-\frac{2\,bde\log\left(cx^n\right)}{3x^3}-\frac{bd^2n}{16x^4}-\frac{2\,ade}{3x^3}-\frac{bd^2\log\left(cx^n\right)}{4x^4}-\frac{ad^2}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*b*e^2*n/x^2 - 1/2*b*e^2*log(c*x^n)/x^2 - 2/9*b*d*e*n/x^3 - 1/2*a*e^2/x
^2 - 2/3*b*d*e*log(c*x^n)/x^3 - 1/16*b*d^2*n/x^4 - 2/3*a*d*e/x^3 - 1/4*b*d^
2*log(c*x^n)/x^4 - 1/4*a*d^2/x^4
```

mupad [B] time = 3.73, size = 85, normalized size = 0.89

$$-\frac{x^2\left(6\,a\,e^2+3\,b\,e^2\,n\right)+3\,a\,d^2+x\left(8\,a\,d\,e+\frac{8\,b\,d\,e\,n}{3}\right)+\frac{3\,b\,d^2\,n}{4}}{12\,x^4}-\frac{\ln\left(c\,x^n\right)\left(\frac{b\,d^2}{4}+\frac{2\,b\,d\,e\,x}{3}+\frac{b\,e^2\,x^2}{2}\right)}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] - (x^2*(6*a*e^2 + 3*b*e^2*n) + 3*a*d^2 + x*(8*a*d*e + (8*b*d*e*n)/3) + (3*b
*d^2*n)/4)/(12*x^4) - (log(c*x^n)*((b*d^2)/4 + (b*e^2*x^2)/2 + (2*b*d*e*x)/
3))/x^4
```

sympy [A] time = 2.75, size = 160, normalized size = 1.68

$$-\frac{ad^2}{4x^4}-\frac{2ade}{3x^3}-\frac{ae^2}{2x^2}-\frac{bd^2n\log(x)}{4x^4}-\frac{bd^2n}{16x^4}-\frac{bd^2\log(c)}{4x^4}-\frac{2bden\log(x)}{3x^3}-\frac{2bden}{9x^3}-\frac{2bde\log(c)}{3x^3}-\frac{be^2n\log(x)}{2x^2}-\frac{be^2n}{4x^2}-\frac{be^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d**2/(4*x**4) - 2*a*d*e/(3*x**3) - a*e**2/(2*x**2) - b*d**2*n*log(x)/(4*
x**4) - b*d**2*n/(16*x**4) - b*d**2*log(c)/(4*x**4) - 2*b*d*e*n*log(x)/(3*x
**3) - 2*b*d*e*n/(9*x**3) - 2*b*d*e*log(c)/(3*x**3) - b*e**2*n*log(x)/(2*x*
*2) - b*e**2*n/(4*x**2) - b*e**2*log(c)/(2*x**2)
```

3.18 $\int \frac{(d+ex)^2\left(a+b\log(cx^n)\right)}{x^6}\,dx$

Optimal. Leaf size=95

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{de\left(a+b\log\left(cx^n\right)\right)}{2x^4}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{bd^2n}{25x^5}-\frac{bden}{8x^4}-\frac{be^2n}{9x^3}$$

```
[Out] -1/25*b*d^2*n/x^5-1/8*b*d*e*n/x^4-1/9*b*e^2*n/x^3-1/5*d^2*(a+b*ln(c*x^n))/x
^5-1/2*d*e*(a+b*ln(c*x^n))/x^4-1/3*e^2*(a+b*ln(c*x^n))/x^3
```

Rubi [A] time = 0.08, antiderivative size = 74, normalized size of antiderivative = 0.78, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 2334, 12, 14}

$$-\frac{1}{30}\left(\frac{6d^2}{x^5}+\frac{15de}{x^4}+\frac{10e^2}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{25x^5}-\frac{bden}{8x^4}-\frac{be^2n}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d^2*n)/(25*x^5) - (b*d*e*n)/(8*x^4) - (b*e^2*n)/(9*x^3) - (((6*d^2)/x^5
 + (15*d*e)/x^4 + (10*e^2)/x^3)*(a + b*Log[c*x^n]))/30
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{x^6}dx = -\frac{1}{30}\left(\frac{6d^2}{x^5}+\frac{15de}{x^4}+\frac{10e^2}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-6d^2-15dex-10e^2x^2}{30x^6}$$
$$= -\frac{1}{30}\left(\frac{6d^2}{x^5}+\frac{15de}{x^4}+\frac{10e^2}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{30}(bn)\int \frac{-6d^2-15dex-10e^2}{x^6}$$
$$= -\frac{1}{30}\left(\frac{6d^2}{x^5}+\frac{15de}{x^4}+\frac{10e^2}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{30}(bn)\int \left(-\frac{6d^2}{x^6}-\frac{15de}{x^5}-\frac{10e^2}{x^4}\right.$$
$$= -\frac{bd^2n}{25x^5}-\frac{bden}{8x^4}-\frac{be^2n}{9x^3}-\frac{1}{30}\left(\frac{6d^2}{x^5}+\frac{15de}{x^4}+\frac{10e^2}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)$$

Mathematica [A] time = 0.04, size = 80, normalized size = 0.84

$$-\frac{60a\left(6d^2+15dex+10e^2x^2\right)+60b\left(6d^2+15dex+10e^2x^2\right)\log\left(cx^n\right)+bn\left(72d^2+225dex+200e^2x^2\right)}{1800x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -1/1800*(60*a*(6*d^2 + 15*d*e*x + 10*e^2*x^2) + b*n*(72*d^2 + 225*d*e*x + 2
00*e^2*x^2) + 60*b*(6*d^2 + 15*d*e*x + 10*e^2*x^2)*Log[c*x^n])/x^5
```

fricas [A] time = 0.89, size = 106, normalized size = 1.12

$$-\frac{72\,bd^2n+360\,ad^2+200\left(be^2n+3\,ae^2\right)x^2+225\,(bden+4\,ade)x+60\left(10\,be^2x^2+15\,bdex+6\,bd^2\right)\log(c)+60\,(}{1800\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/1800*(72*b*d^2*n + 360*a*d^2 + 200*(b*e^2*n + 3*a*e^2)*x^2 + 225*(b*d*e*
n + 4*a*d*e)*x + 60*(10*b*e^2*x^2 + 15*b*d*e*x + 6*b*d^2)*log(c) + 60*(10*b
*e^2*n*x^2 + 15*b*d*e*n*x + 6*b*d^2*n)*log(x))/x^5
```

giac [A] time = 0.28, size = 108, normalized size = 1.14

$$-\frac{600\,bnx^2e^2\log(x)+900\,bdnxe\log(x)+200\,bnx^2e^2+225\,bdnxe+600\,bx^2e^2\log(c)+900\,bdxe\log(c)+360\,bd^2}{1800\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] -1/1800*(600*b*n*x^2*e^2*log(x) + 900*b*d*n*x*e*log(x) + 200*b*n*x^2*e^2 +
225*b*d*n*x*e + 600*b*x^2*e^2*log(c) + 900*b*d*x*e*log(c) + 360*b*d^2*n*log
(x) + 72*b*d^2*n + 600*a*x^2*e^2 + 900*a*d*x*e + 360*b*d^2*log(c) + 360*a*d
^2)/x^5
```

maple [C] time = 0.17, size = 403, normalized size = 4.24

$$-\frac{\left(10e^2x^2+15dex+6d^2\right)b\ln\left(x^n\right)}{30x^5}-\frac{-300i\pi b\,e^2x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)+300i\pi b\,e^2x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(b*ln(c*x^n)+a)/x^6,x)
```

```
[Out] -1/30*b*(10*e^2*x^2+15*d*e*x+6*d^2)/x^5*ln(x^n)-1/1800*(300*I*Pi*b*e^2*x^2*
csgn(I*c*x^n)^2*csgn(I*c)-300*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)+450*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-450*I*Pi*b*d*e*x*csgn(I*c*
x^n)^3+600*b*e^2*x^2*ln(c)+200*b*e^2*n*x^2+600*a*e^2*x^2-180*I*Pi*b*d^2*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-180*I*Pi*b*d^2*csgn(I*c*x^n)^3+180*I*Pi*b*
d^2*csgn(I*c*x^n)^2*csgn(I*c)-450*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)+900*b*d*e*x*ln(c)+225*b*d*e*n*x+900*a*d*e*x+300*I*Pi*b*e^2*x^2*csgn
(I*x^n)*csgn(I*c*x^n)^2+450*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-300*I*
Pi*b*e^2*x^2*csgn(I*c*x^n)^3+180*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+360
*b*d^2*ln(c)+72*b*d^2*n+360*a*d^2)/x^5
```

maxima [A] time = 0.62, size = 100, normalized size = 1.05

$$-\frac{be^2n}{9\,x^3}-\frac{be^2\log\left(cx^n\right)}{3\,x^3}-\frac{bden}{8\,x^4}-\frac{ae^2}{3\,x^3}-\frac{bde\log\left(cx^n\right)}{2\,x^4}-\frac{bd^2n}{25\,x^5}-\frac{ade}{2\,x^4}-\frac{bd^2\log\left(cx^n\right)}{5\,x^5}-\frac{ad^2}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^2*n/x^3 - 1/3*b*e^2*log(c*x^n)/x^3 - 1/8*b*d*e*n/x^4 - 1/3*a*e^2/x
^3 - 1/2*b*d*e*log(c*x^n)/x^4 - 1/25*b*d^2*n/x^5 - 1/2*a*d*e/x^4 - 1/5*b*d^
2*log(c*x^n)/x^5 - 1/5*a*d^2/x^5
```

mupad [B] time = 3.63, size = 85, normalized size = 0.89

$$-\frac{x^2\left(10\,a\,e^2+\frac{10\,b\,e^2\,n}{3}\right)+6\,a\,d^2+x\left(15\,a\,d\,e+\frac{15\,b\,d\,e\,n}{4}\right)+\frac{6\,b\,d^2\,n}{5}}{30\,x^5}-\frac{\ln\left(c\,x^n\right)\left(\frac{b\,d^2}{5}+\frac{b\,d\,e\,x}{2}+\frac{b\,e^2\,x^2}{3}\right)}{x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^2)/x^6,x)
```

```
[Out] - (x^2*(10*a*e^2 + (10*b*e^2*n)/3) + 6*a*d^2 + x*(15*a*d*e + (15*b*d*e*n)/4
) + (6*b*d^2*n)/5)/(30*x^5) - (log(c*x^n)*((b*d^2)/5 + (b*e^2*x^2)/3 + (b*d
*e*x)/2))/x^5
```

sympy [A] time = 4.20, size = 153, normalized size = 1.61

$$-\frac{ad^2}{5x^5}-\frac{ade}{2x^4}-\frac{ae^2}{3x^3}-\frac{bd^2n\log(x)}{5x^5}-\frac{bd^2n}{25x^5}-\frac{bd^2\log(c)}{5x^5}-\frac{bden\log(x)}{2x^4}-\frac{bden}{8x^4}-\frac{bde\log(c)}{2x^4}-\frac{be^2n\log(x)}{3x^3}-\frac{be^2n}{9x^3}-\frac{be^2\,\mathrm{lo}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] -a*d**2/(5*x**5) - a*d*e/(2*x**4) - a*e**2/(3*x**3) - b*d**2*n*log(x)/(5*x*
*5) - b*d**2*n/(25*x**5) - b*d**2*log(c)/(5*x**5) - b*d*e*n*log(x)/(2*x**4)
 - b*d*e*n/(8*x**4) - b*d*e*log(c)/(2*x**4) - b*e**2*n*log(x)/(3*x**3) - b*
e**2*n/(9*x**3) - b*e**2*log(c)/(3*x**3)
```

3.19 $\int x^3(d+ex)^3\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=100

$$\frac{1}{140}\left(35d^3x^4+84d^2ex^5+70de^2x^6+20e^3x^7\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bd^3nx^4-\frac{3}{25}bd^2enx^5-\frac{1}{12}bde^2nx^6-\frac{1}{49}be^3nx^7$$

```
[Out] -1/16*b*d^3*n*x^4-3/25*b*d^2*e*n*x^5-1/12*b*d*e^2*n*x^6-1/49*b*e^3*n*x^7+1/
140*(20*e^3*x^7+70*d*e^2*x^6+84*d^2*e*x^5+35*d^3*x^4)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.11, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 2334, 12, 14}

$$\frac{1}{140}\left(84d^2ex^5+35d^3x^4+70de^2x^6+20e^3x^7\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3}{25}bd^2enx^5-\frac{1}{16}bd^3nx^4-\frac{1}{12}bde^2nx^6-\frac{1}{49}be^3nx^7$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^4)/16 - (3*b*d^2*e*n*x^5)/25 - (b*d*e^2*n*x^6)/12 - (b*e^3*n*x^
7)/49 + ((35*d^3*x^4 + 84*d^2*e*x^5 + 70*d*e^2*x^6 + 20*e^3*x^7)*(a + b*Log
[c*x^n]))/140
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^3(d+ex)^3\left(a+b\log\left(cx^n\right)\right)\,dx = \frac{1}{140}\left(35d^3x^4+84d^2ex^5+70de^2x^6+20e^3x^7\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{}{1}$$
$$= \frac{1}{140}\left(35d^3x^4+84d^2ex^5+70de^2x^6+20e^3x^7\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{140}(bn)$$
$$= \frac{1}{140}\left(35d^3x^4+84d^2ex^5+70de^2x^6+20e^3x^7\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{140}(bn)$$
$$= -\frac{1}{16}bd^3nx^4-\frac{3}{25}bd^2enx^5-\frac{1}{12}bde^2nx^6-\frac{1}{49}be^3nx^7+\frac{1}{140}\left(35d^3x^4+84d\right.$$

Mathematica [A] time = 0.07, size = 133, normalized size = 1.33

$$\frac{1}{4}d^3x^4\left(a+b\log\left(cx^n\right)\right)+\frac{3}{5}d^2ex^5\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}de^2x^6\left(a+b\log\left(cx^n\right)\right)+\frac{1}{7}e^3x^7\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bd^3nx$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -1/16*(b*d^3*n*x^4) - (3*b*d^2*e*n*x^5)/25 - (b*d*e^2*n*x^6)/12 - (b*e^3*n*
x^7)/49 + (d^3*x^4*(a + b*Log[c*x^n]))/4 + (3*d^2*e*x^5*(a + b*Log[c*x^n]))
/5 + (d*e^2*x^6*(a + b*Log[c*x^n]))/2 + (e^3*x^7*(a + b*Log[c*x^n]))/7
```

fricas [A] time = 0.95, size = 167, normalized size = 1.67

$$-\frac{1}{49}\left(be^3n-7\,ae^3\right)x^7-\frac{1}{12}\left(bde^2n-6\,ade^2\right)x^6-\frac{3}{25}\left(bd^2en-5\,ad^2e\right)x^5-\frac{1}{16}\left(bd^3n-4\,ad^3\right)x^4+\frac{1}{140}\left(20\,be^3x^7+70\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/49*(b*e^3*n - 7*a*e^3)*x^7 - 1/12*(b*d*e^2*n - 6*a*d*e^2)*x^6 - 3/25*(b*
d^2*e*n - 5*a*d^2*e)*x^5 - 1/16*(b*d^3*n - 4*a*d^3)*x^4 + 1/140*(20*b*e^3*x
^7 + 70*b*d*e^2*x^6 + 84*b*d^2*e*x^5 + 35*b*d^3*x^4)*log(c) + 1/140*(20*b*e
^3*n*x^7 + 70*b*d*e^2*n*x^6 + 84*b*d^2*e*n*x^5 + 35*b*d^3*n*x^4)*log(x)
```

giac [A] time = 0.25, size = 173, normalized size = 1.73

$$\frac{1}{7}\,bnx^7e^3\log(x)+\frac{1}{2}\,bdnx^6e^2\log(x)+\frac{3}{5}\,bd^2nx^5e\log(x)-\frac{1}{49}\,bnx^7e^3-\frac{1}{12}\,bdnx^6e^2-\frac{3}{25}\,bd^2nx^5e+\frac{1}{7}\,bx^7e^3\log(c)+\frac{1}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7*b*n*x^7*e^3*log(x) + 1/2*b*d*n*x^6*e^2*log(x) + 3/5*b*d^2*n*x^5*e*log(x
) - 1/49*b*n*x^7*e^3 - 1/12*b*d*n*x^6*e^2 - 3/25*b*d^2*n*x^5*e + 1/7*b*x^7*
e^3*log(c) + 1/2*b*d*x^6*e^2*log(c) + 3/5*b*d^2*x^5*e*log(c) + 1/4*b*d^3*n*
x^4*log(x) - 1/16*b*d^3*n*x^4 + 1/7*a*x^7*e^3 + 1/2*a*d*x^6*e^2 + 3/5*a*d^2
*x^5*e + 1/4*b*d^3*x^4*log(c) + 1/4*a*d^3*x^4
```

maple [C] time = 0.22, size = 600, normalized size = 6.00

$$\frac{3a\,d^2e\,x^5}{5}+\frac{3b\,d^2e\,x^5\ln(c)}{5}+\frac{bd\,e^2x^6\ln(c)}{2}+\frac{a\,e^3x^7}{7}+\frac{a\,d^3x^4}{4}+\frac{b\,e^3x^7\ln(c)}{7}+\frac{b\,d^3x^4\ln(c)}{4}+\frac{ad\,e^2x^6}{2}+\frac{\left(20e^3x^3+70d\,e\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] -1/4*I*Pi*b*d*e^2*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/5*a*d^2*e*x^5+3
/5*ln(c)*b*d^2*e*x^5+1/2*ln(c)*b*d*e^2*x^6+1/7*a*e^3*x^7+1/4*a*d^3*x^4+1/7*
ln(c)*b*e^3*x^7+1/4*ln(c)*b*d^3*x^4+1/2*a*d*e^2*x^6+1/140*b*x^4*(20*e^3*x^3
+70*d*e^2*x^2+84*d^2*e*x+35*d^3)*ln(x^n)-3/10*I*Pi*b*d^2*e*x^5*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)-1/14*I*Pi*b*e^3*x^7*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+1/4*I*Pi*b*d*e^2*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*Pi*b*d*e^2*x^6*
csgn(I*c*x^n)^2*csgn(I*c)+3/10*I*Pi*b*d^2*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2
+3/10*I*Pi*b*d^2*e*x^5*csgn(I*c*x^n)^2*csgn(I*c)-1/8*I*Pi*b*d^3*x^4*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-1/14*I*Pi*b*e^3*x^7*csgn(I*c*x^n)^3+1/14*I*Pi*
b*e^3*x^7*csgn(I*c*x^n)^2*csgn(I*c)-3/10*I*Pi*b*d^2*e*x^5*csgn(I*c*x^n)^3+1
/14*I*Pi*b*e^3*x^7*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*Pi*b*d*e^2*x^6*csgn(I*
c*x^n)^3+1/8*I*Pi*b*d^3*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+1/8*I*Pi*b*d^3*x^4*
csgn(I*c*x^n)^2*csgn(I*c)-1/16*b*d^3*n*x^4-1/49*b*e^3*n*x^7-1/8*I*Pi*b*d^3*
x^4*csgn(I*c*x^n)^3-3/25*b*d^2*e*n*x^5-1/12*b*d*e^2*n*x^6
```

maxima [A] time = 0.86, size = 143, normalized size = 1.43

$$-\frac{1}{49}\,be^3nx^7+\frac{1}{7}\,be^3x^7\log\left(cx^n\right)-\frac{1}{12}\,bde^2nx^6+\frac{1}{7}\,ae^3x^7+\frac{1}{2}\,bde^2x^6\log\left(cx^n\right)-\frac{3}{25}\,bd^2enx^5+\frac{1}{2}\,ade^2x^6+\frac{3}{5}\,bd^2ex^5\log\left(c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/49*b*e^3*n*x^7 + 1/7*b*e^3*x^7*log(c*x^n) - 1/12*b*d*e^2*n*x^6 + 1/7*a*e
^3*x^7 + 1/2*b*d*e^2*x^6*log(c*x^n) - 3/25*b*d^2*e*n*x^5 + 1/2*a*d*e^2*x^6
+ 3/5*b*d^2*e*x^5*log(c*x^n) - 1/16*b*d^3*n*x^4 + 3/5*a*d^2*e*x^5 + 1/4*b*d
^3*x^4*log(c*x^n) + 1/4*a*d^3*x^4
```

mupad [B] time = 3.58, size = 113, normalized size = 1.13

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^3\,x^4}{4}+\frac{3\,b\,d^2\,e\,x^5}{5}+\frac{b\,d\,e^2\,x^6}{2}+\frac{b\,e^3\,x^7}{7}\right)+\frac{d^3\,x^4\,\left(4\,a-b\,n\right)}{16}+\frac{e^3\,x^7\,\left(7\,a-b\,n\right)}{49}+\frac{3\,d^2\,e\,x^5\,\left(5\,a-b\,n\right)}{25}+\frac{d\,e}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*log(c*x^n))*(d + e*x)^3,x)
```

```
[Out] log(c*x^n)*((b*d^3*x^4)/4 + (b*e^3*x^7)/7 + (3*b*d^2*e*x^5)/5 + (b*d*e^2*x^
6)/2) + (d^3*x^4*(4*a - b*n))/16 + (e^3*x^7*(7*a - b*n))/49 + (3*d^2*e*x^5*
(5*a - b*n))/25 + (d*e^2*x^6*(6*a - b*n))/12
```

sympy [B] time = 6.49, size = 223, normalized size = 2.23

$$\frac{ad^3x^4}{4}+\frac{3ad^2ex^5}{5}+\frac{ade^2x^6}{2}+\frac{ae^3x^7}{7}+\frac{bd^3nx^4\log\left(x\right)}{4}-\frac{bd^3nx^4}{16}+\frac{bd^3x^4\log\left(c\right)}{4}+\frac{3bd^2enx^5\log\left(x\right)}{5}-\frac{3bd^2enx^5}{25}+\frac{3bd^2ex^5}{5\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**4/4 + 3*a*d**2*e*x**5/5 + a*d*e**2*x**6/2 + a*e**3*x**7/7 + b*d**
3*n*x**4*log(x)/4 - b*d**3*n*x**4/16 + b*d**3*x**4*log(c)/4 + 3*b*d**2*e*n*
x**5*log(x)/5 - 3*b*d**2*e*n*x**5/25 + 3*b*d**2*e*x**5*log(c)/5 + b*d*e**2*
n*x**6*log(x)/2 - b*d*e**2*n*x**6/12 + b*d*e**2*x**6*log(c)/2 + b*e**3*n*x*
*7*log(x)/7 - b*e**3*n*x**7/49 + b*e**3*x**7*log(c)/7
```

3.20 $\int x^2(d+ex)^3 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=100

$$\frac{1}{60}\left(20d^3x^3+45d^2ex^4+36de^2x^5+10e^3x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bd^3nx^3-\frac{3}{16}bd^2enx^4-\frac{3}{25}bde^2nx^5-\frac{1}{36}be^3nx^6$$

```
[Out] -1/9*b*d^3*n*x^3-3/16*b*d^2*e*n*x^4-3/25*b*d*e^2*n*x^5-1/36*b*e^3*n*x^6+1/6
0*(10*e^3*x^6+36*d*e^2*x^5+45*d^2*e*x^4+20*d^3*x^3)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.10, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {43, 2334, 12, 14}

$$\frac{1}{60}\left(45d^2ex^4+20d^3x^3+36de^2x^5+10e^3x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3}{16}bd^2enx^4-\frac{1}{9}bd^3nx^3-\frac{3}{25}bde^2nx^5-\frac{1}{36}be^3nx^6$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^3)/9 - (3*b*d^2*e*n*x^4)/16 - (3*b*d*e^2*n*x^5)/25 - (b*e^3*n*x
^6)/36 + ((20*d^3*x^3 + 45*d^2*e*x^4 + 36*d*e^2*x^5 + 10*e^3*x^6)*(a + b*Lo
g[c*x^n]))/60
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^2(d+ex)^3\left(a+b\log\left(cx^n\right)\right)dx = \frac{1}{60}\left(20d^3x^3+45d^2ex^4+36de^2x^5+10e^3x^6\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{60}x^2$$
$$= \frac{1}{60}\left(20d^3x^3+45d^2ex^4+36de^2x^5+10e^3x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int x^2$$
$$= \frac{1}{60}\left(20d^3x^3+45d^2ex^4+36de^2x^5+10e^3x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int (2$$
$$= -\frac{1}{9}bd^3nx^3-\frac{3}{16}bd^2enx^4-\frac{3}{25}bde^2nx^5-\frac{1}{36}be^3nx^6+\frac{1}{60}\left(20d^3x^3+45d^2ex^4\right.$$

Mathematica [A] time = 0.05, size = 133, normalized size = 1.33

$$\frac{1}{3}d^3x^3\left(a+b\log\left(cx^n\right)\right)+\frac{3}{4}d^2ex^4\left(a+b\log\left(cx^n\right)\right)+\frac{3}{5}de^2x^5\left(a+b\log\left(cx^n\right)\right)+\frac{1}{6}e^3x^6\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bd^3nx^3-\frac{3}{16}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -1/9*(b*d^3*n*x^3) - (3*b*d^2*e*n*x^4)/16 - (3*b*d*e^2*n*x^5)/25 - (b*e^3*n
*x^6)/36 + (d^3*x^3*(a + b*Log[c*x^n]))/3 + (3*d^2*e*x^4*(a + b*Log[c*x^n])
)/4 + (3*d*e^2*x^5*(a + b*Log[c*x^n]))/5 + (e^3*x^6*(a + b*Log[c*x^n]))/6
```

fricas [A] time = 0.55, size = 167, normalized size = 1.67

$$-\frac{1}{36}\left(be^3n-6\,ae^3\right)x^6-\frac{3}{25}\left(bde^2n-5\,ade^2\right)x^5-\frac{3}{16}\left(bd^2en-4\,ad^2e\right)x^4-\frac{1}{9}\left(bd^3n-3\,ad^3\right)x^3+\frac{1}{60}\left(10\,be^3x^6+36\,bde^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*(b*e^3*n - 6*a*e^3)*x^6 - 3/25*(b*d*e^2*n - 5*a*d*e^2)*x^5 - 3/16*(b*
d^2*e*n - 4*a*d^2*e)*x^4 - 1/9*(b*d^3*n - 3*a*d^3)*x^3 + 1/60*(10*b*e^3*x^6
 + 36*b*d*e^2*x^5 + 45*b*d^2*e*x^4 + 20*b*d^3*x^3)*log(c) + 1/60*(10*b*e^3*
n*x^6 + 36*b*d*e^2*n*x^5 + 45*b*d^2*e*n*x^4 + 20*b*d^3*n*x^3)*log(x)
```

giac [A] time = 0.29, size = 173, normalized size = 1.73

$$\frac{1}{6}\,bnx^6e^3\log(x)+\frac{3}{5}\,bdnx^5e^2\log(x)+\frac{3}{4}\,bd^2nx^4e\log(x)-\frac{1}{36}\,bnx^6e^3-\frac{3}{25}\,bdnx^5e^2-\frac{3}{16}\,bd^2nx^4e+\frac{1}{6}\,bx^6e^3\log(c)+\frac{3}{5}\,bd$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*b*n*x^6*e^3*log(x) + 3/5*b*d*n*x^5*e^2*log(x) + 3/4*b*d^2*n*x^4*e*log(x
) - 1/36*b*n*x^6*e^3 - 3/25*b*d*n*x^5*e^2 - 3/16*b*d^2*n*x^4*e + 1/6*b*x^6*
e^3*log(c) + 3/5*b*d*x^5*e^2*log(c) + 3/4*b*d^2*x^4*e*log(c) + 1/3*b*d^3*n*
x^3*log(x) - 1/9*b*d^3*n*x^3 + 1/6*a*x^6*e^3 + 3/5*a*d*x^5*e^2 + 3/4*a*d^2*
x^4*e + 1/3*b*d^3*x^3*log(c) + 1/3*a*d^3*x^3
```

maple [C] time = 0.23, size = 600, normalized size = 6.00

$$\frac{a\,e^3x^6}{6}+\frac{a\,d^3x^3}{3}+\frac{3ad\,e^2x^5}{5}+\frac{3a\,d^2e\,x^4}{4}+\frac{3b\,d^2e\,x^4\ln(c)}{4}+\frac{3bd\,e^2x^5\ln(c)}{5}+\frac{b\,d^3x^3\ln(c)}{3}+\frac{b\,e^3x^6\ln(c)}{6}-\frac{3i\pi bd\,e^2x^5\mathrm{csgn}(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] -3/8*I*Pi*b*d^2*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3/10*I*Pi*b*d*e^2
*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/8*I*Pi*b*d^2*e*x^4*csgn(I*x^n)*c
sgn(I*c*x^n)^2+1/6*a*e^3*x^6+1/3*a*d^3*x^3+3/5*a*d*e^2*x^5+3/4*a*d^2*e*x^4+
3/4*ln(c)*b*d^2*e*x^4+3/5*ln(c)*b*d*e^2*x^5+1/3*ln(c)*b*d^3*x^3+1/6*ln(c)*b
*e^3*x^6+3/10*I*Pi*b*d*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+3/8*I*Pi*b*d^2*e
*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/60*b*x^3*(10*e^3*x^3+36*d*e^2*x^2+45*d^2*e
*x+20*d^3)*ln(x^n)-1/6*I*Pi*b*d^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1
/12*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/10*I*Pi*b*d*e^2*x^
5*csgn(I*c*x^n)^2*csgn(I*c)-3/8*I*Pi*b*d^2*e*x^4*csgn(I*c*x^n)^3+1/6*I*Pi*b
*d^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/6*I*Pi*b*d^3*x^3*csgn(I*c*x^n)^2*csg
n(I*c)+1/12*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*csgn(I*c)-3/10*I*Pi*b*d*e^2*x^5*
csgn(I*c*x^n)^3+1/12*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2-1/9*b*d^3*n
*x^3-1/36*b*e^3*n*x^6-1/6*I*Pi*b*d^3*x^3*csgn(I*c*x^n)^3-1/12*I*Pi*b*e^3*x^
6*csgn(I*c*x^n)^3-3/16*b*d^2*e*n*x^4-3/25*b*d*e^2*n*x^5
```

maxima [A] time = 0.60, size = 143, normalized size = 1.43

$$-\frac{1}{36}\,be^3nx^6+\frac{1}{6}\,be^3x^6\log\left(cx^n\right)-\frac{3}{25}\,bde^2nx^5+\frac{1}{6}\,ae^3x^6+\frac{3}{5}\,bde^2x^5\log\left(cx^n\right)-\frac{3}{16}\,bd^2enx^4+\frac{3}{5}\,ade^2x^5+\frac{3}{4}\,bd^2ex^4\log$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*b*e^3*n*x^6 + 1/6*b*e^3*x^6*log(c*x^n) - 3/25*b*d*e^2*n*x^5 + 1/6*a*e
^3*x^6 + 3/5*b*d*e^2*x^5*log(c*x^n) - 3/16*b*d^2*e*n*x^4 + 3/5*a*d*e^2*x^5
+ 3/4*b*d^2*e*x^4*log(c*x^n) - 1/9*b*d^3*n*x^3 + 3/4*a*d^2*e*x^4 + 1/3*b*d^
3*x^3*log(c*x^n) + 1/3*a*d^3*x^3
```

mupad [B] time = 3.64, size = 113, normalized size = 1.13

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^3\,x^3}{3}+\frac{3\,b\,d^2\,e\,x^4}{4}+\frac{3\,b\,d\,e^2\,x^5}{5}+\frac{b\,e^3\,x^6}{6}\right)+\frac{d^3\,x^3\,\left(3\,a-b\,n\right)}{9}+\frac{e^3\,x^6\,\left(6\,a-b\,n\right)}{36}+\frac{3\,d^2\,e\,x^4\,\left(4\,a-b\,n\right)}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*log(c*x^n))*(d + e*x)^3,x)
```

```
[Out] log(c*x^n)*((b*d^3*x^3)/3 + (b*e^3*x^6)/6 + (3*b*d^2*e*x^4)/4 + (3*b*d*e^2*
x^5)/5) + (d^3*x^3*(3*a - b*n))/9 + (e^3*x^6*(6*a - b*n))/36 + (3*d^2*e*x^4
*(4*a - b*n))/16 + (3*d*e^2*x^5*(5*a - b*n))/25
```

sympy [B] time = 4.31, size = 230, normalized size = 2.30

$$\frac{ad^3x^3}{3}+\frac{3ad^2ex^4}{4}+\frac{3ade^2x^5}{5}+\frac{ae^3x^6}{6}+\frac{bd^3nx^3\log\left(x\right)}{3}-\frac{bd^3nx^3}{9}+\frac{bd^3x^3\log\left(c\right)}{3}+\frac{3bd^2enx^4\log\left(x\right)}{4}-\frac{3bd^2enx^4}{16}+\frac{3bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**3/3 + 3*a*d**2*e*x**4/4 + 3*a*d*e**2*x**5/5 + a*e**3*x**6/6 + b*d
**3*n*x**3*log(x)/3 - b*d**3*n*x**3/9 + b*d**3*x**3*log(c)/3 + 3*b*d**2*e*n
*x**4*log(x)/4 - 3*b*d**2*e*n*x**4/16 + 3*b*d**2*e*x**4*log(c)/4 + 3*b*d*e*
*2*n*x**5*log(x)/5 - 3*b*d*e**2*n*x**5/25 + 3*b*d*e**2*x**5*log(c)/5 + b*e*
*3*n*x**6*log(x)/6 - b*e**3*n*x**6/36 + b*e**3*x**6*log(c)/6
```

3.21 $\int x(d+ex)^3 \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=122

$$-\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{bd^5n\log(x)}{20e^2}+\frac{bd^4nx}{5e}+\frac{3}{20}bd^3nx^2+\frac{1}{15}bd^2enx^3+\frac{1}{80}bde^2nx^4-\frac{bn(}{}$$

```
[Out] 1/5*b*d^4*n*x/e+3/20*b*d^3*n*x^2+1/15*b*d^2*e*n*x^3+1/80*b*d*e^2*n*x^4-1/25
*b*n*(e*x+d)^5/e^2+1/20*b*d^5*n*ln(x)/e^2-1/20*(5*d*(e*x+d)^4/e^2-4*(e*x+d)
^5/e^2)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.09, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {43, 2334, 12, 80}

$$-\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{bd^5n\log(x)}{20e^2}+\frac{1}{15}bd^2enx^3+\frac{bd^4nx}{5e}+\frac{3}{20}bd^3nx^2+\frac{1}{80}bde^2nx^4-\frac{bn(}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (b*d^4*n*x)/(5*e) + (3*b*d^3*n*x^2)/20 + (b*d^2*e*n*x^3)/15 + (b*d*e^2*n*x^
4)/80 - (b*n*(d + e*x)^5)/(25*e^2) + (b*d^5*n*Log[x])/(20*e^2) - (((5*d*(d
+ e*x)^4)/e^2 - (4*(d + e*x)^5)/e^2)*(a + b*Log[c*x^n]))/20
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

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

Rule 80

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x(d+ex)^3\left(a+b\log\left(cx^n\right)\right)dx = -\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{(d+ex)^4(-d+}{20e^2x}$$

$$= -\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int\frac{(d+ex)^4(-d+4ex)}{x}d}{20e^2}$$

$$= -\frac{bn(d+ex)^5}{25e^2}-\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{(bdn)\int}{2}$$

$$= -\frac{bn(d+ex)^5}{25e^2}-\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{(bdn)\int}{}$$

$$= \frac{bd^4nx}{5e}+\frac{3}{20}bd^3nx^2+\frac{1}{15}bd^2enx^3+\frac{1}{80}bde^2nx^4-\frac{bn(d+ex)^5}{25e^2}+\frac{bd^5n\log(}{20e^2}$$

Mathematica [A] time = 0.12, size = 130, normalized size = 1.07

$$\frac{1}{2}d^3x^2\left(a+b\log\left(cx^n\right)\right)+d^2ex^3\left(a+b\log\left(cx^n\right)\right)+\frac{3}{4}de^2x^4\left(a+b\log\left(cx^n\right)\right)+\frac{1}{5}e^3x^5\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bd^3nx^2-$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -1/4*(b*d^3*n*x^2) - (b*d^2*e*n*x^3)/3 - (3*b*d*e^2*n*x^4)/16 - (b*e^3*n*x^
5)/25 + (d^3*x^2*(a + b*Log[c*x^n]))/2 + d^2*e*x^3*(a + b*Log[c*x^n]) + (3*
d*e^2*x^4*(a + b*Log[c*x^n]))/4 + (e^3*x^5*(a + b*Log[c*x^n]))/5
```

fricas [A] time = 0.51, size = 167, normalized size = 1.37

$$-\frac{1}{25}\left(be^3n-5\,ae^3\right)x^5-\frac{3}{16}\left(bde^2n-4\,ade^2\right)x^4-\frac{1}{3}\left(bd^2en-3\,ad^2e\right)x^3-\frac{1}{4}\left(bd^3n-2\,ad^3\right)x^2+\frac{1}{20}\left(4\,be^3x^5+15\,bde^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*(b*e^3*n - 5*a*e^3)*x^5 - 3/16*(b*d*e^2*n - 4*a*d*e^2)*x^4 - 1/3*(b*d
^2*e*n - 3*a*d^2*e)*x^3 - 1/4*(b*d^3*n - 2*a*d^3)*x^2 + 1/20*(4*b*e^3*x^5 +
 15*b*d*e^2*x^4 + 20*b*d^2*e*x^3 + 10*b*d^3*x^2)*log(c) + 1/20*(4*b*e^3*n*x
^5 + 15*b*d*e^2*n*x^4 + 20*b*d^2*e*n*x^3 + 10*b*d^3*n*x^2)*log(x)
```

giac [A] time = 0.39, size = 170, normalized size = 1.39

$$\frac{1}{5}bnx^5e^3\log(x)+\frac{3}{4}bdnx^4e^2\log(x)+bd^2nx^3e\log(x)-\frac{1}{25}bnx^5e^3-\frac{3}{16}bdnx^4e^2-\frac{1}{3}bd^2nx^3e+\frac{1}{5}bx^5e^3\log(c)+\frac{3}{4}bdx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*b*n*x^5*e^3*log(x) + 3/4*b*d*n*x^4*e^2*log(x) + b*d^2*n*x^3*e*log(x) -
1/25*b*n*x^5*e^3 - 3/16*b*d*n*x^4*e^2 - 1/3*b*d^2*n*x^3*e + 1/5*b*x^5*e^3*l
og(c) + 3/4*b*d*x^4*e^2*log(c) + b*d^2*x^3*e*log(c) + 1/2*b*d^3*n*x^2*log(x
) - 1/4*b*d^3*n*x^2 + 1/5*a*x^5*e^3 + 3/4*a*d*x^4*e^2 + a*d^2*x^3*e + 1/2*b
*d^3*x^2*log(c) + 1/2*a*d^3*x^2
```

maple [C] time = 0.24, size = 598, normalized size = 4.90

$$\frac{a\,d^3x^2}{2}+b\,d^2e\,x^3\ln(c)+\frac{3bd\,e^2x^4\ln(c)}{4}+\frac{a\,e^3x^5}{5}+\frac{3ad\,e^2x^4}{4}+a\,d^2e\,x^3-\frac{3i\pi bd\,e^2x^4\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{8}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 3/8*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*Pi*b*d^2*e*x^3*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3/8*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+1/2*a*d^3*x^2+ln(c)*b*d^2*e*x^3+3/4*ln(c)*b*d*e^2*x^4+1/5*a*e^
3*x^5+3/4*a*d*e^2*x^4+a*d^2*e*x^3+1/2*I*Pi*b*d^2*e*x^3*csgn(I*x^n)*csgn(I*c
*x^n)^2-1/10*I*Pi*b*e^3*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*Pi*b*
d^2*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/5*ln(c)*b*e^3*x^5+1/2*ln(c)*b*d^3*x^2
+1/20*b*x^2*(4*e^3*x^3+15*d*e^2*x^2+20*d^2*e*x+10*d^3)*ln(x^n)+3/8*I*Pi*b*d
*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1/4*I*Pi*b*d^3*x^2*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)-3/8*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^3-1/2*I*Pi*b*d^2*e*x^3*cs
gn(I*c*x^n)^3+1/10*I*Pi*b*e^3*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+1/10*I*Pi*b*e
^3*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*Pi*b*d^3*x^2*csgn(I*x^n)*csgn(I*c*x^
n)^2+1/4*I*Pi*b*d^3*x^2*csgn(I*c*x^n)^2*csgn(I*c)-1/4*b*d^3*n*x^2-1/10*I*Pi
*b*e^3*x^5*csgn(I*c*x^n)^3-1/4*I*Pi*b*d^3*x^2*csgn(I*c*x^n)^3-1/25*b*e^3*n*
x^5-1/3*b*d^2*e*n*x^3-3/16*b*d*e^2*n*x^4
```

maxima [A] time = 0.74, size = 141, normalized size = 1.16

$$-\frac{1}{25}\,be^3nx^5+\frac{1}{5}\,be^3x^5\log\left(cx^n\right)-\frac{3}{16}\,bde^2nx^4+\frac{1}{5}\,ae^3x^5+\frac{3}{4}\,bde^2x^4\log\left(cx^n\right)-\frac{1}{3}\,bd^2enx^3+\frac{3}{4}\,ade^2x^4+bd^2ex^3\log\left(cx^n\right)-$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*b*e^3*n*x^5 + 1/5*b*e^3*x^5*log(c*x^n) - 3/16*b*d*e^2*n*x^4 + 1/5*a*e
^3*x^5 + 3/4*b*d*e^2*x^4*log(c*x^n) - 1/3*b*d^2*e*n*x^3 + 3/4*a*d*e^2*x^4 +
 b*d^2*e*x^3*log(c*x^n) - 1/4*b*d^3*n*x^2 + a*d^2*e*x^3 + 1/2*b*d^3*x^2*log
(c*x^n) + 1/2*a*d^3*x^2
```

mupad [B] time = 3.61, size = 112, normalized size = 0.92

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^3\,x^2}{2}+b\,d^2\,e\,x^3+\frac{3\,b\,d\,e^2\,x^4}{4}+\frac{b\,e^3\,x^5}{5}\right)+\frac{d^3\,x^2\,\left(2\,a-b\,n\right)}{4}+\frac{e^3\,x^5\,\left(5\,a-b\,n\right)}{25}+\frac{d^2\,e\,x^3\,\left(3\,a-b\,n\right)}{3}+\frac{3\,d\,e^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*log(c*x^n))*(d + e*x)^3,x)
```

```
[Out] log(c*x^n)*((b*d^3*x^2)/2 + (b*e^3*x^5)/5 + b*d^2*e*x^3 + (3*b*d*e^2*x^4)/4
) + (d^3*x^2*(2*a - b*n))/4 + (e^3*x^5*(5*a - b*n))/25 + (d^2*e*x^3*(3*a -
b*n))/3 + (3*d*e^2*x^4*(4*a - b*n))/16
```

sympy [A] time = 2.83, size = 218, normalized size = 1.79

$$\frac{ad^3x^2}{2}+ad^2ex^3+\frac{3ade^2x^4}{4}+\frac{ae^3x^5}{5}+\frac{bd^3nx^2\log\left(x\right)}{2}-\frac{bd^3nx^2}{4}+\frac{bd^3x^2\log\left(c\right)}{2}+bd^2enx^3\log\left(x\right)-\frac{bd^2enx^3}{3}+bd^2ex^3\log\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**2/2 + a*d**2*e*x**3 + 3*a*d*e**2*x**4/4 + a*e**3*x**5/5 + b*d**3*
n*x**2*log(x)/2 - b*d**3*n*x**2/4 + b*d**3*x**2*log(c)/2 + b*d**2*e*n*x**3*
log(x) - b*d**2*e*n*x**3/3 + b*d**2*e*x**3*log(c) + 3*b*d*e**2*n*x**4*log(x
)/4 - 3*b*d*e**2*n*x**4/16 + 3*b*d*e**2*x**4*log(c)/4 + b*e**3*n*x**5*log(x
)/5 - b*e**3*n*x**5/25 + b*e**3*x**5*log(c)/5
```

3.22 $\int (d+ex)^3 \left(a+b\log \left(cx^n\right)\right) \, dx$

Optimal. Leaf size=85

$$\frac{(d+ex)^4 \left(a+b\log \left(cx^n\right)\right)}{4e}-\frac{bd^4n\log(x)}{4e}-bd^3nx-\frac{3}{4}bd^2enx^2-\frac{1}{3}bde^2nx^3-\frac{1}{16}be^3nx^4$$

```
[Out] -b*d^3*n*x-3/4*b*d^2*e*n*x^2-1/3*b*d*e^2*n*x^3-1/16*b*e^3*n*x^4-1/4*b*d^4*n
*ln(x)/e+1/4*(e*x+d)^4*(a+b*ln(c*x^n))/e
```

Rubi [A] time = 0.04, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {32, 2313, 12, 43}

$$\frac{(d+ex)^4 \left(a+b\log \left(cx^n\right)\right)}{4e}-\frac{3}{4}bd^2enx^2-\frac{bd^4n\log(x)}{4e}-bd^3nx-\frac{1}{3}bde^2nx^3-\frac{1}{16}be^3nx^4$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x) - (3*b*d^2*e*n*x^2)/4 - (b*d*e^2*n*x^3)/3 - (b*e^3*n*x^4)/16 -
 (b*d^4*n*Log[x])/(4*e) + ((d + e*x)^4*(a + b*Log[c*x^n]))/(4*e)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 32

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

Rule 43

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

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\int (d+ex)^3 \left(a+b\log\left(cx^n\right)\right) dx = \frac{(d+ex)^4 \left(a+b\log\left(cx^n\right)\right)}{4e} - (bn)\int \frac{(d+ex)^4}{4ex}\, dx$$
$$= \frac{(d+ex)^4 \left(a+b\log\left(cx^n\right)\right)}{4e} - \frac{(bn)\int \frac{(d+ex)^4}{x}\, dx}{4e}$$
$$= \frac{(d+ex)^4 \left(a+b\log\left(cx^n\right)\right)}{4e} - \frac{(bn)\int \left(4d^3e+\frac{d^4}{x}+6d^2e^2x+4de^3x^2+e^4x^3\right) dx}{4e}$$
$$= -bd^3nx - \frac{3}{4}bd^2enx^2 - \frac{1}{3}bde^2nx^3 - \frac{1}{16}be^3nx^4 - \frac{bd^4n\log(x)}{4e} + \frac{(d+ex)^4 \left(a+b\right.}{4e}$$

Mathematica [A] time = 0.05, size = 110, normalized size = 1.29

$$\frac{1}{48}x\left(12a\left(4d^3+6d^2ex+4de^2x^2+e^3x^3\right)+12b\left(4d^3+6d^2ex+4de^2x^2+e^3x^3\right)\log\left(cx^n\right)-bn\left(48d^3+36d^2ex+16\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x*(12*a*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 + e^3*x^3) - b*n*(48*d^3 + 36*d^2
*e*x + 16*d*e^2*x^2 + 3*e^3*x^3) + 12*b*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 +
e^3*x^3)*Log[c*x^n]))/48
```

fricas [B] time = 0.51, size = 159, normalized size = 1.87

$$-\frac{1}{16}\left(be^3n-4\,ae^3\right)x^4-\frac{1}{3}\left(bde^2n-3\,ade^2\right)x^3-\frac{3}{4}\left(bd^2en-2\,ad^2e\right)x^2-\left(bd^3n-ad^3\right)x+\frac{1}{4}\left(be^3x^4+4\,bde^2x^3+6\,bd^2ex\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*(b*e^3*n - 4*a*e^3)*x^4 - 1/3*(b*d*e^2*n - 3*a*d*e^2)*x^3 - 3/4*(b*d^
2*e*n - 2*a*d^2*e)*x^2 - (b*d^3*n - a*d^3)*x + 1/4*(b*e^3*x^4 + 4*b*d*e^2*x
^3 + 6*b*d^2*e*x^2 + 4*b*d^3*x)*log(c) + 1/4*(b*e^3*n*x^4 + 4*b*d*e^2*n*x^3
 + 6*b*d^2*e*n*x^2 + 4*b*d^3*n*x)*log(x)
```

giac [B] time = 0.32, size = 159, normalized size = 1.87

$$\frac{1}{4}\,bnx^4e^3\log(x)+bdnx^3e^2\log(x)+\frac{3}{2}\,bd^2nx^2e\log(x)-\frac{1}{16}\,bnx^4e^3-\frac{1}{3}\,bdnx^3e^2-\frac{3}{4}\,bd^2nx^2e+\frac{1}{4}\,bx^4e^3\log(c)+bdx^3e^2\log$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b*n*x^4*e^3*log(x) + b*d*n*x^3*e^2*log(x) + 3/2*b*d^2*n*x^2*e*log(x) -
1/16*b*n*x^4*e^3 - 1/3*b*d*n*x^3*e^2 - 3/4*b*d^2*n*x^2*e + 1/4*b*x^4*e^3*lo
g(c) + b*d*x^3*e^2*log(c) + 3/2*b*d^2*x^2*e*log(c) + b*d^3*n*x*log(x) - b*d
^3*n*x + 1/4*a*x^4*e^3 + a*d*x^3*e^2 + 3/2*a*d^2*x^2*e + b*d^3*x*log(c) + a
*d^3*x
```

maple [C] time = 0.26, size = 571, normalized size = 6.72

$$bd\,e^2x^3\ln(c)+\frac{3b\,d^2e\,x^2\ln(c)}{2}-\frac{b\,d^4n\ln(x)}{4e}+\frac{(ex+d)^4\,b\ln\left(x^n\right)}{4e}+ad\,e^2x^3+\frac{3a\,d^2e\,x^2}{2}+\frac{b\,e^3x^4\ln(c)}{4}+b\,d^3x\ln(c)+\frac{a\,e^3x}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] ln(c)*b*d*e^2*x^3+3/2*ln(c)*b*d^2*e*x^2-1/4*b*d^4*n*ln(x)/e+1/4*(e*x+d)^4*b
/e*ln(x^n)+a*d*e^2*x^3+3/2*a*d^2*e*x^2+1/4*ln(c)*b*e^3*x^4+ln(c)*b*d^3*x+1/
4*a*e^3*x^4+a*d^3*x-1/8*I*e^3*Pi*b*x^4*csgn(I*c*x^n)^3-1/2*I*e^2*Pi*b*d*x^3
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*b*d^3*csgn(I*c*x^n)^3*x+1/8*I
*e^3*Pi*b*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+1/8*I*e^3*Pi*b*x^4*csgn(I*c*x^n)^
2*csgn(I*c)-1/2*I*e^2*Pi*b*d*x^3*csgn(I*c*x^n)^3-3/4*I*e*Pi*b*d^2*x^2*csgn(
I*c*x^n)^3+1/2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x+1/2*I*Pi*b*d^3*csgn
(I*c*x^n)^2*csgn(I*c)*x-1/16*b*e^3*n*x^4-3/4*I*e*Pi*b*d^2*x^2*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x
-1/8*I*e^3*Pi*b*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*e^2*Pi*b*d*x^
3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*e^2*Pi*b*d*x^3*csgn(I*c*x^n)^2*csgn(I*c
)+3/4*I*e*Pi*b*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+3/4*I*e*Pi*b*d^2*x^2*csg
n(I*c*x^n)^2*csgn(I*c)-b*d^3*n*x-3/4*b*d^2*e*n*x^2-1/3*b*d*e^2*n*x^3
```

maxima [A] time = 0.70, size = 133, normalized size = 1.56

$$-\frac{1}{16}be^3nx^4+\frac{1}{4}be^3x^4\log(cx^n)-\frac{1}{3}bde^2nx^3+\frac{1}{4}ae^3x^4+bde^2x^3\log(cx^n)-\frac{3}{4}bd^2enx^2+ade^2x^3+\frac{3}{2}bd^2ex^2\log(cx^n)-$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*b*e^3*n*x^4 + 1/4*b*e^3*x^4*log(c*x^n) - 1/3*b*d*e^2*n*x^3 + 1/4*a*e^
3*x^4 + b*d*e^2*x^3*log(c*x^n) - 3/4*b*d^2*e*n*x^2 + a*d*e^2*x^3 + 3/2*b*d^
2*e*x^2*log(c*x^n) - b*d^3*n*x + 3/2*a*d^2*e*x^2 + b*d^3*x*log(c*x^n) + a*d
^3*x
```

mupad [B] time = 3.57, size = 104, normalized size = 1.22

$$\ln(c\,x^n)\left(b\,d^3\,x+\frac{3\,b\,d^2\,e\,x^2}{2}+b\,d\,e^2\,x^3+\frac{b\,e^3\,x^4}{4}\right)+\frac{e^3\,x^4\,(4\,a-b\,n)}{16}+d^3\,x\,(a-b\,n)+\frac{3\,d^2\,e\,x^2\,(2\,a-b\,n)}{4}+\frac{d\,e^2\,x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))*(d + e*x)^3,x)
```

```
[Out] log(c*x^n)*((b*e^3*x^4)/4 + b*d^3*x + (3*b*d^2*e*x^2)/2 + b*d*e^2*x^3) + (e
^3*x^4*(4*a - b*n))/16 + d^3*x*(a - b*n) + (3*d^2*e*x^2*(2*a - b*n))/4 + (d
*e^2*x^3*(3*a - b*n))/3
```

sympy [B] time = 1.80, size = 204, normalized size = 2.40

$$ad^3x+\frac{3ad^2ex^2}{2}+ade^2x^3+\frac{ae^3x^4}{4}+bd^3nx\log(x)-bd^3nx+bd^3x\log(c)+\frac{3bd^2enx^2\log(x)}{2}-\frac{3bd^2enx^2}{4}+\frac{3bd^2ex^2\log}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x + 3*a*d**2*e*x**2/2 + a*d*e**2*x**3 + a*e**3*x**4/4 + b*d**3*n*x*l
og(x) - b*d**3*n*x + b*d**3*x*log(c) + 3*b*d**2*e*n*x**2*log(x)/2 - 3*b*d**
2*e*n*x**2/4 + 3*b*d**2*e*x**2*log(c)/2 + b*d*e**2*n*x**3*log(x) - b*d*e**2
*n*x**3/3 + b*d*e**2*x**3*log(c) + b*e**3*n*x**4*log(x)/4 - b*e**3*n*x**4/1
6 + b*e**3*x**4*log(c)/4
```

3.23 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=122

$$d^3\log(x)\left(a+b\log\left(cx^n\right)\right)+3d^2ex\left(a+b\log\left(cx^n\right)\right)+\frac{3}{2}de^2x^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}e^3x^3\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^3n\log^2$$

```
[Out] -3*b*d^2*e*n*x-3/4*b*d*e^2*n*x^2-1/9*b*e^3*n*x^3-1/2*b*d^3*n*ln(x)^2+3*d^2*
e*x*(a+b*ln(c*x^n))+3/2*d*e^2*x^2*(a+b*ln(c*x^n))+1/3*e^3*x^3*(a+b*ln(c*x^n
))+d^3*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.09, antiderivative size = 94, normalized size of antiderivative = 0.77, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {43, 2334, 2301}

$$\frac{1}{6}\left(18d^2ex+6d^3\log(x)+9de^2x^2+2e^3x^3\right)\left(a+b\log\left(cx^n\right)\right)-3bd^2enx-\frac{1}{2}bd^3n\log^2(x)-\frac{3}{4}bde^2nx^2-\frac{1}{9}be^3nx^3$$

Antiderivative was successfully verified.

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

```
[Out] -3*b*d^2*e*n*x - (3*b*d*e^2*n*x^2)/4 - (b*e^3*n*x^3)/9 - (b*d^3*n*Log[x]^2)
/2 + ((18*d^2*e*x + 9*d*e^2*x^2 + 2*e^3*x^3 + 6*d^3*Log[x])*(a + b*Log[c*x^
n]))/6
```

Rule 43

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{x}\,dx &= \frac{1}{6}\left(18d^2ex+9de^2x^2+2e^3x^3+6d^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(\frac{1}{6}e\left(18d\right.\right.\\ &= \frac{1}{6}\left(18d^2ex+9de^2x^2+2e^3x^3+6d^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\left(bd^3n\right)\int\frac{\log(x)}{x}\\ &= -3bd^2enx-\frac{3}{4}bde^2nx^2-\frac{1}{9}be^3nx^3-\frac{1}{2}bd^3n\log^2(x)+\frac{1}{6}\left(18d^2ex+9de^2x^2+2e\right.\end{aligned}$$

Mathematica [A] time = 0.06, size = 123, normalized size = 1.01

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+\frac{3}{2}de^2x^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}e^3x^3\left(a+b\log\left(cx^n\right)\right)+3ad^2ex+3bd^2ex\log\left(cx^n\right)-3bd^2enx-\frac{3}{4}bd$$

Antiderivative was successfully verified.

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

```
[Out] 3*a*d^2*e*x - 3*b*d^2*e*n*x - (3*b*d*e^2*n*x^2)/4 - (b*e^3*n*x^3)/9 + 3*b*d
^2*e*x*Log[c*x^n] + (3*d*e^2*x^2*(a + b*Log[c*x^n]))/2 + (e^3*x^3*(a + b*Lo
g[c*x^n]))/3 + (d^3*(a + b*Log[c*x^n])^2)/(2*b*n)
```

fricas [A] time = 0.54, size = 149, normalized size = 1.22

$$\frac{1}{2}bd^3n\log(x)^2-\frac{1}{9}\left(be^3n-3\,ae^3\right)x^3-\frac{3}{4}\left(bde^2n-2\,ade^2\right)x^2-3\left(bd^2en-ad^2e\right)x+\frac{1}{6}\left(2\,be^3x^3+9\,bde^2x^2+18\,bd^2ex\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b*d^3*n*log(x)^2 - 1/9*(b*e^3*n - 3*a*e^3)*x^3 - 3/4*(b*d*e^2*n - 2*a*d
*e^2)*x^2 - 3*(b*d^2*e*n - a*d^2*e)*x + 1/6*(2*b*e^3*x^3 + 9*b*d*e^2*x^2 +
18*b*d^2*e*x)*log(c) + 1/6*(2*b*e^3*n*x^3 + 9*b*d*e^2*n*x^2 + 18*b*d^2*e*n*
x + 6*b*d^3*log(c) + 6*a*d^3)*log(x)
```

giac [A] time = 0.30, size = 150, normalized size = 1.23

$$\frac{1}{3}bnx^3e^3\log(x)+\frac{3}{2}bdnx^2e^2\log(x)+3\,bd^2nxe\log(x)+\frac{1}{2}bd^3n\log(x)^2-\frac{1}{9}bnx^3e^3-\frac{3}{4}bdnx^2e^2-3\,bd^2nxe+\frac{1}{3}bx^3e^3$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.30, size = 579, normalized size = 4.75

$$\frac{3bd\,e^2x^2\ln(c)}{2}+3b\,d^2ex\ln(c)-\frac{i\pi b\,d^3\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln(x)}{2}+\frac{3ad\,e^2x^2}{2}+3a\,d^2ex+\frac{a\,e^3x^3}{3}+\frac{b\,e^3x^3\,\mathrm{l}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 3/2*ln(c)*b*d*e^2*x^2+3*ln(c)*b*d^2*e*x+3/2*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^2*
csgn(I*c)-1/2*I*ln(x)*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/2*a*d*
e^2*x^2+3*a*d^2*e*x+3/4*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+3/4*I*
Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+3/2*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*
c*x^n)^2*e*x-1/6*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/3*a*e
^3*x^3+1/3*ln(c)*b*e^3*x^3+(1/3*b*e^3*x^3+3/2*b*d*e^2*x^2+3*b*d^2*e*x+b*d^3
*ln(x))*ln(x^n)+ln(x)*ln(c)*b*d^3+ln(x)*a*d^3-3/4*I*Pi*b*d*e^2*x^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-3/2*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)-1/9*b*e^3*n*x^3-1/6*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3-1/2*I*ln(x)*Pi*b
*d^3*csgn(I*c*x^n)^3-3/2*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3+1/6*I*Pi*b*e^3*x^3*
csgn(I*x^n)*csgn(I*c*x^n)^2-3/4*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3+1/2*I*ln(x
)*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*ln(x)*Pi*b*d^3*csgn(I*c*x^n)^2
*csgn(I*c)+1/6*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/2*b*d^3*n*ln(x)^2
-3*b*d^2*e*n*x-3/4*b*d*e^2*n*x^2
```

maxima [A] time = 0.63, size = 127, normalized size = 1.04

$$-\frac{1}{9}be^3nx^3+\frac{1}{3}be^3x^3\log\left(cx^n\right)-\frac{3}{4}bde^2nx^2+\frac{1}{3}ae^3x^3+\frac{3}{2}bde^2x^2\log\left(cx^n\right)-3\,bd^2enx+\frac{3}{2}ade^2x^2+3\,bd^2ex\log\left(cx^n\right)+$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 3.64, size = 106, normalized size = 0.87

$$\ln(c\,x^n)\,\left(3\,b\,d^2\,e\,x+\frac{3\,b\,d\,e^2\,x^2}{2}+\frac{b\,e^3\,x^3}{3}\right)+\frac{e^3\,x^3\,\left(3\,a-b\,n\right)}{9}+a\,d^3\,\ln(x)+\frac{b\,d^3\,\ln(c\,x^n)^2}{2\,n}+\frac{3\,d\,e^2\,x^2\,\left(2\,a-b\,n\right)}{4}+3\,d^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] log(c*x^n)*((b*e^3*x^3)/3 + 3*b*d^2*e*x + (3*b*d*e^2*x^2)/2) + (e^3*x^3*(3*
a - b*n))/9 + a*d^3*log(x) + (b*d^3*log(c*x^n)^2)/(2*n) + (3*d*e^2*x^2*(2*a
 - b*n))/4 + 3*d^2*e*x*(a - b*n)
```

sympy [A] time = 1.86, size = 199, normalized size = 1.63

$$ad^3\log(x)+3ad^2ex+\frac{3ade^2x^2}{2}+\frac{ae^3x^3}{3}+\frac{bd^3n\log(x)^2}{2}+bd^3\log(c)\log(x)+3bd^2enx\log(x)-3bd^2enx+3bd^2ex\log(c$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**3*log(x) + 3*a*d**2*e*x + 3*a*d*e**2*x**2/2 + a*e**3*x**3/3 + b*d**3*n
*log(x)**2/2 + b*d**3*log(c)*log(x) + 3*b*d**2*e*n*x*log(x) - 3*b*d**2*e*n*
x + 3*b*d**2*e*x*log(c) + 3*b*d*e**2*n*x**2*log(x)/2 - 3*b*d*e**2*n*x**2/4
+ 3*b*d*e**2*x**2*log(c)/2 + b*e**3*n*x**3*log(x)/3 - b*e**3*n*x**3/9 + b*e
**3*x**3*log(c)/3
```

3.24 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=119

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{x}+3d^2e\log(x)\left(a+b\log\left(cx^n\right)\right)+3de^2x\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}e^3x^2\left(a+b\log\left(cx^n\right)\right)-\frac{bd^3n}{x}-\frac{3}{2}$$

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

Rubi [A] time = 0.09, antiderivative size = 92, normalized size of antiderivative = 0.77, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {43, 2334, 2301}

$$-\frac{1}{2}\left(-6d^2e\log(x)+\frac{2d^3}{x}-6de^2x-e^3x^2\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3}{2}bd^2en\log^2(x)-\frac{bd^3n}{x}-3bde^2nx-\frac{1}{4}be^3nx^2$$

Antiderivative was successfully verified.

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

```
[Out] -((b*d^3*n)/x) - 3*b*d*e^2*n*x - (b*e^3*n*x^2)/4 - (3*b*d^2*e*n*Log[x]^2)/2
 - (((2*d^3)/x - 6*d*e^2*x - e^3*x^2 - 6*d^2*e*Log[x])*(a + b*Log[c*x^n]))/
2
```

Rule 43

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx &= -\frac{1}{2}\left(\frac{2d^3}{x}-6de^2x-e^3x^2-6d^2e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(3de^2-\right.\\ &= -\frac{bd^3n}{x}-3bde^2nx-\frac{1}{4}be^3nx^2-\frac{1}{2}\left(\frac{2d^3}{x}-6de^2x-e^3x^2-6d^2e\log(x)\right)\left(a+\right.\\ &= -\frac{bd^3n}{x}-3bde^2nx-\frac{1}{4}be^3nx^2-\frac{3}{2}bd^2en\log^2(x)-\frac{1}{2}\left(\frac{2d^3}{x}-6de^2x-e^3x^2-\right.\end{aligned}$$

Mathematica [A] time = 0.08, size = 118, normalized size = 0.99

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+\frac{1}{2}e^3x^2\left(a+b\log\left(cx^n\right)\right)+3ade^2x+3bde^2x\log\left(cx^n\right)-\frac{bd^3n}{x}-3bde^2nx$$

Antiderivative was successfully verified.

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

```
[Out] -((b*d^3*n)/x) + 3*a*d*e^2*x - 3*b*d*e^2*n*x - (b*e^3*n*x^2)/4 + 3*b*d*e^2*
x*Log[c*x^n] - (d^3*(a + b*Log[c*x^n]))/x + (e^3*x^2*(a + b*Log[c*x^n]))/2
+ (3*d^2*e*(a + b*Log[c*x^n])^2)/(2*b*n)
```

fricas [A] time = 0.57, size = 149, normalized size = 1.25

$$\frac{6\,bd^2enx\log(x)^2-4\,bd^3n-4\,ad^3-\left(be^3n-2\,ae^3\right)x^3-12\left(bde^2n-ade^2\right)x^2+2\left(be^3x^3+6\,bde^2x^2-2\,bd^3\right)\log(c)}{4\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(6*b*d^2*e*n*x*log(x)^2 - 4*b*d^3*n - 4*a*d^3 - (b*e^3*n - 2*a*e^3)*x^3
 - 12*(b*d*e^2*n - a*d*e^2)*x^2 + 2*(b*e^3*x^3 + 6*b*d*e^2*x^2 - 2*b*d^3)*l
og(c) + 2*(b*e^3*n*x^3 + 6*b*d*e^2*n*x^2 + 6*b*d^2*e*x*log(c) - 2*b*d^3*n +
 6*a*d^2*e*x)*log(x))/x
```

giac [A] time = 0.30, size = 154, normalized size = 1.29

$$\frac{6\,bd^2nxe\log(x)^2+2\,bnx^3e^3\log(x)+12\,bdnx^2e^2\log(x)+12\,bd^2xe\log(c)\log(x)-bnx^3e^3-12\,bdnx^2e^2+2\,bx^3e^3}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.33, size = 588, normalized size = 4.94

$$-\frac{\left(-e^3x^3-6d^2ex\ln(x)-6d\,e^2x^2+2d^3\right)b\ln\left(x^n\right)}{2x}-\frac{-12bd\,e^2x^2\ln(c)-12ad\,e^2x^2-12a\,d^2ex\ln(x)+4a\,d^3-2a\,e^3x^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b*(-e^3*x^3-6*d^2*e*ln(x)*x-6*d*e^2*x^2+2*d^3)/x*ln(x^n)-1/4*(-12*b*d*
e^2*x^2*ln(c)+6*I*ln(x)*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-12
*a*d*e^2*x^2-12*ln(x)*a*d^2*e*x+4*a*d^3-6*I*ln(x)*Pi*b*d^2*e*csgn(I*c*x^n)^
2*csgn(I*c)*x-2*a*e^3*x^3+4*b*d^3*n+4*ln(c)*b*d^3-2*b*e^3*x^3*ln(c)+6*I*Pi*
b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-6*I*ln(x)*Pi*b*d^2*e*csgn(I
*x^n)*csgn(I*c*x^n)^2*x+I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-
6*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-6*I*Pi*b*d*e^2*x^2*csgn(I*c*
x^n)^2*csgn(I*c)-2*I*Pi*b*d^3*csgn(I*c*x^n)^3+b*e^3*n*x^3+6*I*ln(x)*Pi*b*d^
2*e*csgn(I*c*x^n)^3*x-12*ln(x)*ln(c)*b*d^2*e*x+6*b*d^2*e*n*ln(x)^2*x+I*Pi*b
*e^3*x^3*csgn(I*c*x^n)^3+2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi*b*
d^3*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-I*
```

```
Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+6*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3+12*b*d*e^2*n*x^2)/x
```

maxima [A] time = 0.57, size = 127, normalized size = 1.07

$$-\frac{1}{4}be^3nx^2+\frac{1}{2}be^3x^2\log(cx^n)-3bde^2nx+\frac{1}{2}ae^3x^2+3bde^2x\log(cx^n)+3ade^2x+\frac{3bd^2e\log(cx^n)^2}{2n}+3ad^2e\log(x)-$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 3.65, size = 154, normalized size = 1.29

$$\ln(x)\left(3ad^2e+3bd^2en\right)-\ln(cx^n)\left(\frac{bd^3+3bd^2ex+3bde^2x^2+be^3x^3}{x}-\frac{\frac{3be^3x^3}{2}+6bde^2x^2}{x}\right)-\frac{ad^3+bd^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 1.87, size = 182, normalized size = 1.53

$$-\frac{ad^3}{x}+3ad^2e\log(x)+3ade^2x+\frac{ae^3x^2}{2}-\frac{bd^3n\log(x)}{x}-\frac{bd^3n}{x}-\frac{bd^3\log(c)}{x}+\frac{3bd^2en\log(x)^2}{2}+3bd^2e\log(c)\log(x)+$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d**3/x + 3*a*d**2*e*log(x) + 3*a*d*e**2*x + a*e**3*x**2/2 - b*d**3*n*log
(x)/x - b*d**3*n/x - b*d**3*log(c)/x + 3*b*d**2*e*n*log(x)**2/2 + 3*b*d**2*
e*log(c)*log(x) + 3*b*d*e**2*n*x*log(x) - 3*b*d*e**2*n*x + 3*b*d*e**2*x*log
(c) + b*e**3*n*x**2*log(x)/2 - b*e**3*n*x**2/4 + b*e**3*x**2*log(c)/2
```

3.25 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=118

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{x}+3de^2\log(x)\left(a+b\log\left(cx^n\right)\right)+e^3x\left(a+b\log\left(cx^n\right)\right)-\frac{bd^3n}{4x^2}-\frac{3bd^2en}{x}-$$

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

Rubi [A] time = 0.09, antiderivative size = 91, normalized size of antiderivative = 0.77, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {43, 2334, 2301}

$$-\frac{1}{2}\left(\frac{6d^2e}{x}+\frac{d^3}{x^2}-6de^2\log(x)-2e^3x\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2en}{x}-\frac{bd^3n}{4x^2}-\frac{3}{2}bde^2n\log^2(x)-be^3nx$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^3*n)/(4*x^2) - (3*b*d^2*e*n)/x - b*e^3*n*x - (3*b*d*e^2*n*Log[x]^2)/2
 - ((d^3/x^2 + (6*d^2*e)/x - 2*e^3*x - 6*d*e^2*Log[x])*(a + b*Log[c*x^n]))/
2
```

Rule 43

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx=-\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{6d^2e}{x}-2e^3x-6de^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(e^3-\frac{d^3}{2x^3}-\right.$$

$$=-\frac{bd^3n}{4x^2}-\frac{3bd^2en}{x}-be^3nx-\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{6d^2e}{x}-2e^3x-6de^2\log(x)\right)\left(a+b\log\left(cx\right.\right.$$

$$=-\frac{bd^3n}{4x^2}-\frac{3bd^2en}{x}-be^3nx-\frac{3}{2}bde^2n\log^2(x)-\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{6d^2e}{x}-2e^3x-6de^2\log\right.$$

Mathematica [A] time = 0.08, size = 115, normalized size = 0.97

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{3de^2\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+ae^3x+be^3x\log\left(cx^n\right)-\frac{bd^3n}{4x^2}-\frac{3bd^2en}{x}-be$$

Antiderivative was successfully verified.

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

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

fricas [A] time = 0.56, size = 150, normalized size = 1.27

$$\frac{6\,bde^2nx^2\log(x)^2-bd^3n-2\,ad^3-4\left(be^3n-ae^3\right)x^3-12\left(bd^2en+ad^2e\right)x+2\left(2\,be^3x^3-6\,bd^2ex-bd^3\right)\log(c)}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [A] time = 0.28, size = 154, normalized size = 1.31

$$\frac{6\,bdnx^2e^2\log(x)^2+4\,bnx^3e^3\log(x)-12\,bd^2nxe\log(x)+12\,bdx^2e^2\log(c)\log(x)-4\,bnx^3e^3-12\,bd^2nxe+4\,b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.33, size = 586, normalized size = 4.97

$$-\frac{\left(-6d\,e^2x^2\ln(x)-2e^3x^3+6d^2ex+d^3\right)b\ln\left(x^n\right)}{2x^2}-\frac{12b\,d^2ex\ln(c)+12a\,d^2ex+2a\,d^3-4a\,e^3x^3+b\,d^3n+2b\,d^3\,\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b*(-6*d*e^2*ln(x)*x^2-2*e^3*x^3+6*d^2*e*x+d^3)/x^2*ln(x^n)-1/4*(12*b*d
^2*e*x*ln(c)+12*a*d^2*e*x+2*a*d^3-4*a*e^3*x^3+b*d^3*n+2*b*d^3*ln(c)-4*b*e^3
*x^3*ln(c)+6*I*ln(x)*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2-12*
ln(x)*a*d*e^2*x^2-6*I*ln(x)*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^2-6*I*
ln(x)*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*x^2-6*I*Pi*b*d^2*e*x*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)-6*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3+4*b*e^3*n*x^3+6*I
*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*e*x+2*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)-2*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*e
^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)-I*Pi*b*d^3*csgn(I*c*x^n)^3+6*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+
6*I*ln(x)*Pi*b*d*e^2*csgn(I*c*x^n)^3*x^2-12*ln(x)*ln(c)*b*d*e^2*x^2+6*b*d*e
```

```
^2*n*ln(x)^2*x^2+2*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3+I*Pi*b*d^3*csgn(I*x^n)*cs
gn(I*c*x^n)^2+I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+12*b*d^2*e*n*x)/x^2
```

maxima [A] time = 0.63, size = 125, normalized size = 1.06

$$-be^3nx+be^3x\log(cx^n)+ae^3x+\frac{3\,bde^2\log(cx^n)^2}{2\,n}+3\,ade^2\log(x)-\frac{3\,bd^2en}{x}-\frac{3\,bd^2e\log(cx^n)}{x}-\frac{bd^3n}{4\,x^2}-\frac{3\,ad^2e}{x}-\frac{bd^3\log}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 3.59, size = 139, normalized size = 1.18

$$\ln(x)\left(3\,a\,d\,e^2+\frac{9\,b\,d\,e^2\,n}{2}\right)-\ln(c\,x^n)\left(\frac{\frac{b\,d^3}{2}+3\,b\,d^2\,e\,x+\frac{9\,b\,d\,e^2\,x^2}{2}+2\,b\,e^3\,x^3}{x^2}-3\,b\,e^3\,x\right)-\frac{x\left(6\,a\,d^2\,e+6\,b\,d^2\,e\,n\right)+a}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] log(x)*(3*a*d*e^2 + (9*b*d*e^2*n)/2) - log(c*x^n)*(((b*d^3)/2 + 2*b*e^3*x^3
 + 3*b*d^2*e*x + (9*b*d*e^2*x^2)/2)/x^2 - 3*b*e^3*x) - (x*(6*a*d^2*e + 6*b*
d^2*e*n) + a*d^3 + (b*d^3*n)/2)/(2*x^2) + e^3*x*(a - b*n) + (3*b*d*e^2*log(
c*x^n)^2)/(2*n)
```

sympy [A] time = 1.97, size = 182, normalized size = 1.54

$$-\frac{ad^3}{2x^2}-\frac{3ad^2e}{x}+3ade^2\log(x)+ae^3x-\frac{bd^3n\log(x)}{2x^2}-\frac{bd^3n}{4x^2}-\frac{bd^3\log(c)}{2x^2}-\frac{3bd^2en\log(x)}{x}-\frac{3bd^2en}{x}-\frac{3bd^2e\log(c)}{x}+\frac{3bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d**3/(2*x**2) - 3*a*d**2*e/x + 3*a*d*e**2*log(x) + a*e**3*x - b*d**3*n*l
og(x)/(2*x**2) - b*d**3*n/(4*x**2) - b*d**3*log(c)/(2*x**2) - 3*b*d**2*e*n*
log(x)/x - 3*b*d**2*e*n/x - 3*b*d**2*e*log(c)/x + 3*b*d*e**2*n*log(x)**2/2
+ 3*b*d*e**2*log(c)*log(x) + b*e**3*n*x*log(x) - b*e**3*n*x + b*e**3*x*log(
c)
```

3.26 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=126

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{3de^2\left(a+b\log\left(cx^n\right)\right)}{x}+e^3\log(x)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^3n}{9x^3}-\frac{3bd^2e}{4x^2}$$

```
[Out] -1/9*b*d^3*n/x^3-3/4*b*d^2*e*n/x^2-3*b*d*e^2*n/x-1/2*b*e^3*n*ln(x)^2-1/3*d^
3*(a+b*ln(c*x^n))/x^3-3/2*d^2*e*(a+b*ln(c*x^n))/x^2-3*d*e^2*(a+b*ln(c*x^n))
/x+e^3*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.11, antiderivative size = 98, normalized size of antiderivative = 0.78, number of steps used = 5, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {43, 2334, 14, 2301}

$$-\frac{1}{6}\left(\frac{9d^2e}{x^2}+\frac{2d^3}{x^3}+\frac{18de^2}{x}-6e^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2en}{4x^2}-\frac{bd^3n}{9x^3}-\frac{3bde^2n}{x}-\frac{1}{2}be^3n\log^2(x)$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^3*n)/(9*x^3) - (3*b*d^2*e*n)/(4*x^2) - (3*b*d*e^2*n)/x - (b*e^3*n*Log
[x]^2)/2 - (((2*d^3)/x^3 + (9*d^2*e)/x^2 + (18*d*e^2)/x - 6*e^3*Log[x])*(a
+ b*Log[c*x^n]))/6
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{x^4}dx = -\frac{1}{6}\left(\frac{2d^3}{x^3}+\frac{9d^2e}{x^2}+\frac{18de^2}{x}-6e^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(-\frac{d\left(2d^2+\right.}{}\right.$$
$$= -\frac{1}{6}\left(\frac{2d^3}{x^3}+\frac{9d^2e}{x^2}+\frac{18de^2}{x}-6e^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)+\frac{1}{6}(bdn)\int\frac{2d^2+9}{}$$
$$= -\frac{1}{2}be^3n\log^2(x)-\frac{1}{6}\left(\frac{2d^3}{x^3}+\frac{9d^2e}{x^2}+\frac{18de^2}{x}-6e^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)+\frac{1}{6}($$
$$= -\frac{bd^3n}{9x^3}-\frac{3bd^2en}{4x^2}-\frac{3bde^2n}{x}-\frac{1}{2}be^3n\log^2(x)-\frac{1}{6}\left(\frac{2d^3}{x^3}+\frac{9d^2e}{x^2}+\frac{18de^2}{x}-6e^3\mathrm{l}\right.$$

Mathematica [A] time = 0.08, size = 122, normalized size = 0.97

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{3de^2\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{e^3\left(a+b\log\left(cx^n\right)\right)^2}{2bn}-\frac{bd^3n}{9x^3}-\frac{3bd^2en}{4x^2}-\frac{3bde^2}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -1/9*(b*d^3*n)/x^3 - (3*b*d^2*e*n)/(4*x^2) - (3*b*d*e^2*n)/x - (d^3*(a + b*
Log[c*x^n]))/(3*x^3) - (3*d^2*e*(a + b*Log[c*x^n]))/(2*x^2) - (3*d*e^2*(a +
 b*Log[c*x^n]))/x + (e^3*(a + b*Log[c*x^n])^2)/(2*b*n)
```

fricas [A] time = 0.41, size = 151, normalized size = 1.20

$$\frac{18\,be^3nx^3\log(x)^2-4\,bd^3n-12\,ad^3-108\left(bde^2n+ade^2\right)x^2-27\left(bd^2en+2\,ad^2e\right)x-6\left(18\,bde^2x^2+9\,bd^2ex+2\,b\right.}{36\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] 1/36*(18*b*e^3*n*x^3*log(x)^2 - 4*b*d^3*n - 12*a*d^3 - 108*(b*d*e^2*n + a*d
*e^2)*x^2 - 27*(b*d^2*e*n + 2*a*d^2*e)*x - 6*(18*b*d*e^2*x^2 + 9*b*d^2*e*x
+ 2*b*d^3)*log(c) + 6*(6*b*e^3*x^3*log(c) - 18*b*d*e^2*n*x^2 + 6*a*e^3*x^3
- 9*b*d^2*e*n*x - 2*b*d^3*n)*log(x))/x^3
```

giac [A] time = 0.29, size = 155, normalized size = 1.23

$$\frac{18\,bnx^3e^3\log(x)^2-108\,bdnx^2e^2\log(x)-54\,bd^2nxe\log(x)+36\,bx^3e^3\log(c)\log(x)-108\,bdnx^2e^2-27\,bd^2nxe-}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] 1/36*(18*b*n*x^3*e^3*log(x)^2 - 108*b*d*n*x^2*e^2*log(x) - 54*b*d^2*n*x*e*l
og(x) + 36*b*x^3*e^3*log(c)*log(x) - 108*b*d*n*x^2*e^2 - 27*b*d^2*n*x*e - 1
08*b*d*x^2*e^2*log(c) - 54*b*d^2*x*e*log(c) - 12*b*d^3*n*log(x) + 36*a*x^3*
e^3*log(x) - 4*b*d^3*n - 108*a*d*x^2*e^2 - 54*a*d^2*x*e - 12*b*d^3*log(c) -
 12*a*d^3)/x^3
```

maple [C] time = 0.26, size = 589, normalized size = 4.67

$$-\frac{\left(-6e^3x^3\ln(x)+18d\,e^2x^2+9d^2ex+2d^3\right)b\ln\left(x^n\right)}{6x^3}-\frac{108bd\,e^2x^2\ln(c)+54b\,d^2ex\ln(c)+108ad\,e^2x^2+54a\,d^2ex+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(b*ln(c*x^n)+a)/x^4,x)
```

```
[Out] -1/6*b*(-6*e^3*ln(x)*x^3+18*d*e^2*x^2+9*d^2*e*x+2*d^3)/x^3*ln(x^n)-1/36*(10
8*b*d*e^2*x^2*ln(c)+54*b*d^2*e*x*ln(c)+108*a*d*e^2*x^2+54*a*d^2*e*x+12*a*d^
3+4*b*d^3*n-36*ln(x)*a*e^3*x^3+12*b*d^3*ln(c)-54*I*Pi*b*d*e^2*x^2*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+18*I*ln(x)*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*x^3-27*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*I*ln(x
)*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*x^3+27*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c
*x^n)^2*e*x+54*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+27*I*Pi*b*d^2*e
*x*csgn(I*c*x^n)^2*csgn(I*c)-54*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3-6*I*Pi*b*d
^3*csgn(I*c*x^n)^3+54*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-18*I*ln(x)
*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^3-36*ln(x)*ln(c)*b*e^3*x^3+18*b*e^3
*n*ln(x)^2*x^3+6*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+6*I*Pi*b*d^3*csgn(I
*c*x^n)^2*csgn(I*c)+27*b*d^2*e*n*x+108*b*d*e^2*n*x^2+18*I*ln(x)*Pi*b*e^3*cs
gn(I*c*x^n)^3*x^3-27*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3-6*I*Pi*b*d^3*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c))/x^3
```

maxima [A] time = 0.62, size = 133, normalized size = 1.06

$$\frac{be^3\log\left(cx^n\right)^2}{2n}+ae^3\log(x)-\frac{3\,bde^2n}{x}-\frac{3\,bde^2\log\left(cx^n\right)}{x}-\frac{3\,bd^2en}{4\,x^2}-\frac{3\,ade^2}{x}-\frac{3\,bd^2e\log\left(cx^n\right)}{2\,x^2}-\frac{bd^3n}{9\,x^3}-\frac{3\,ad^2e}{2\,x^2}-\frac{bd^3\log\left(cx^n\right)}{3\,x^3}\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

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

mupad [B] time = 3.72, size = 136, normalized size = 1.08

$$\ln(x)\left(a\,e^3+\frac{11\,b\,e^3\,n}{6}\right)-\frac{x\,\left(9\,a\,d^2\,e+\frac{9\,b\,d^2\,e\,n}{2}\right)+2\,a\,d^3+x^2\,\left(18\,a\,d\,e^2+18\,b\,d\,e^2\,n\right)+\frac{2\,b\,d^3\,n}{3}}{6\,x^3}-\frac{\ln\left(c\,x^n\right)\,\left(\frac{b\,d^3}{3}+\cdots\right)}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^3)/x^4,x)
```

```
[Out] log(x)*(a*e^3 + (11*b*e^3*n)/6) - (x*(9*a*d^2*e + (9*b*d^2*e*n)/2) + 2*a*d^
3 + x^2*(18*a*d*e^2 + 18*b*d*e^2*n) + (2*b*d^3*n)/3)/(6*x^3) - (log(c*x^n)*
((b*d^3)/3 + (11*b*e^3*x^3)/6 + (3*b*d^2*e*x)/2 + 3*b*d*e^2*x^2))/x^3 + (b*
e^3*log(c*x^n)^2)/(2*n)
```

sympy [A] time = 8.05, size = 144, normalized size = 1.14

$$-\frac{ad^3}{3x^3}-\frac{3ad^2e}{2x^2}-\frac{3ade^2}{x}+ae^3\log(x)+bd^3\left(-\frac{n}{9x^3}-\frac{\log\left(cx^n\right)}{3x^3}\right)+3bd^2e\left(-\frac{n}{4x^2}-\frac{\log\left(cx^n\right)}{2x^2}\right)+3bde^2\left(-\frac{n}{x}-\frac{\log\left(cx^n\right)}{x}\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d**3/(3*x**3) - 3*a*d**2*e/(2*x**2) - 3*a*d*e**2/x + a*e**3*log(x) + b*d
**3*(-n/(9*x**3) - log(c*x**n)/(3*x**3)) + 3*b*d**2*e*(-n/(4*x**2) - log(c*
x**n)/(2*x**2)) + 3*b*d*e**2*(-n/x - log(c*x**n)/x) - b*e**3*Piecewise((-lo
g(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True))
```

3.27 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=90

$$-\frac{(d+ex)^4\left(a+b\log\left(cx^n\right)\right)}{4dx^4}-\frac{bd^3n}{16x^4}-\frac{bd^2en}{3x^3}+\frac{be^4n\log(x)}{4d}-\frac{3bde^2n}{4x^2}-\frac{be^3n}{x}$$

```
[Out] -1/16*b*d^3*n/x^4-1/3*b*d^2*e*n/x^3-3/4*b*d*e^2*n/x^2-b*e^3*n/x+1/4*b*e^4*n
*ln(x)/d-1/4*(e*x+d)^4*(a+b*ln(c*x^n))/d/x^4
```

Rubi [A] time = 0.08, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = $\{37, 2334, 12, 43\}$

$$-\frac{(d+ex)^4\left(a+b\log\left(cx^n\right)\right)}{4dx^4}-\frac{bd^2en}{3x^3}-\frac{bd^3n}{16x^4}-\frac{3bde^2n}{4x^2}+\frac{be^4n\log(x)}{4d}-\frac{be^3n}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d^3*n)/(16*x^4) - (b*d^2*e*n)/(3*x^3) - (3*b*d*e^2*n)/(4*x^2) - (b*e^3*
n)/x + (b*e^4*n*Log[x])/(4*d) - ((d + e*x)^4*(a + b*Log[c*x^n]))/(4*d*x^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

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

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{x^5}\,dx = -\frac{(d+ex)^4\left(a+b\log\left(cx^n\right)\right)}{4dx^4} - (bn)\int -\frac{(d+ex)^4}{4dx^5}\,dx$$
$$= -\frac{(d+ex)^4\left(a+b\log\left(cx^n\right)\right)}{4dx^4} + \frac{(bn)\int \frac{(d+ex)^4}{x^5}\,dx}{4d}$$
$$= -\frac{(d+ex)^4\left(a+b\log\left(cx^n\right)\right)}{4dx^4} + \frac{(bn)\int\left(\frac{d^4}{x^5}+\frac{4d^3e}{x^4}+\frac{6d^2e^2}{x^3}+\frac{4de^3}{x^2}+\frac{e^4}{x}\right)dx}{4d}$$
$$= -\frac{bd^3n}{16x^4} - \frac{bd^2en}{3x^3} - \frac{3bde^2n}{4x^2} - \frac{be^3n}{x} + \frac{be^4n\log(x)}{4d} - \frac{(d+ex)^4\left(a+b\log\left(cx^n\right.\right.}{4dx^4}$$

Mathematica [A] time = 0.06, size = 109, normalized size = 1.21

$$-\frac{12a\left(d^3+4d^2ex+6de^2x^2+4e^3x^3\right)+12b\left(d^3+4d^2ex+6de^2x^2+4e^3x^3\right)\log\left(cx^n\right)+bn\left(3d^3+16d^2ex+36de\right.}{48x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -1/48*(12*a*(d^3 + 4*d^2*e*x + 6*d*e^2*x^2 + 4*e^3*x^3) + b*n*(3*d^3 + 16*d
^2*e*x + 36*d*e^2*x^2 + 48*e^3*x^3) + 12*b*(d^3 + 4*d^2*e*x + 6*d*e^2*x^2 +
 4*e^3*x^3)*Log[c*x^n])/x^4
```

fricas [A] time = 0.42, size = 152, normalized size = 1.69

$$-\frac{3\,bd^3n+12\,ad^3+48\left(be^3n+ae^3\right)x^3+36\left(bde^2n+2\,ade^2\right)x^2+16\left(bd^2en+3\,ad^2e\right)x+12\left(4\,be^3x^3+6\,bde^2x^2\right.}{48\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/48*(3*b*d^3*n + 12*a*d^3 + 48*(b*e^3*n + a*e^3)*x^3 + 36*(b*d*e^2*n + 2*
a*d*e^2)*x^2 + 16*(b*d^2*e*n + 3*a*d^2*e)*x + 12*(4*b*e^3*x^3 + 6*b*d*e^2*x
^2 + 4*b*d^2*e*x + b*d^3)*log(c) + 12*(4*b*e^3*n*x^3 + 6*b*d*e^2*n*x^2 + 4*
b*d^2*e*n*x + b*d^3*n)*log(x))/x^4
```

giac [A] time = 0.32, size = 158, normalized size = 1.76

$$-\frac{48\,bnx^3e^3\log(x)+72\,bdnx^2e^2\log(x)+48\,bd^2nxe\log(x)+48\,bnx^3e^3+36\,bdnx^2e^2+16\,bd^2nxe+48\,bx^3e^3\,\mathrm{lo}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/48*(48*b*n*x^3*e^3*log(x) + 72*b*d*n*x^2*e^2*log(x) + 48*b*d^2*n*x*e*log
(x) + 48*b*n*x^3*e^3 + 36*b*d*n*x^2*e^2 + 16*b*d^2*n*x*e + 48*b*x^3*e^3*log
(c) + 72*b*d*x^2*e^2*log(c) + 48*b*d^2*x*e*log(c) + 12*b*d^3*n*log(x) + 3*b
*d^3*n + 48*a*x^3*e^3 + 72*a*d*x^2*e^2 + 48*a*d^2*x*e + 12*b*d^3*log(c) + 1
2*a*d^3)/x^4
```

maple [C] time = 0.18, size = 569, normalized size = 6.32

$$-\frac{\left(4e^3x^3+6d\,e^2x^2+4d^2ex+d^3\right)b\ln\left(x^n\right)}{4x^4}-\frac{72bd\,e^2x^2\ln(c)+48b\,d^2ex\ln(c)+72ad\,e^2x^2+48a\,d^2ex+12a\,d^3+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(b*ln(c*x^n)+a)/x^5,x)
```

```
[Out] -1/4*b*(4*e^3*x^3+6*d*e^2*x^2+4*d^2*e*x+d^3)/x^4*ln(x^n)-1/48*(72*b*d*e^2*x
^2*ln(c)+48*b*d^2*e*x*ln(c)+72*a*d*e^2*x^2+48*a*d^2*e*x+12*a*d^3+48*a*e^3*x
^3+3*b*d^3*n+24*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*e*x-24*I*Pi*b*e^3*x^
3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+12*b*d^3*ln(c)+48*b*e^3*x^3*ln(c)+24*
I*Pi*b*d^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)-36*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-24*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
+48*b*e^3*n*x^3+36*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-6*I*Pi*b*d^3*
csgn(I*c*x^n)^3+36*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+24*I*Pi*b*e
^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)+24*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n
)^2-24*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3+6*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n
)^2+6*I*Pi*b*d^3*csgn(I*c)*csgn(I*c*x^n)^2-36*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n
)^3-24*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3+16*b*d^2*e*n*x+36*b*d*e^2*n*x^2-6*I*P
i*b*d^3*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n))/x^4
```

maxima [A] time = 0.67, size = 143, normalized size = 1.59

$$-\frac{be^3n}{x}-\frac{be^3\log(cx^n)}{x}-\frac{3\,bde^2n}{4\,x^2}-\frac{ae^3}{x}-\frac{3\,bde^2\log(cx^n)}{2\,x^2}-\frac{bd^2en}{3\,x^3}-\frac{3\,ade^2}{2\,x^2}-\frac{bd^2e\log(cx^n)}{x^3}-\frac{bd^3n}{16\,x^4}-\frac{ad^2e}{x^3}-\frac{bd^3\log(cx^n)}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*e^3*n/x - b*e^3*log(c*x^n)/x - 3/4*b*d*e^2*n/x^2 - a*e^3/x - 3/2*b*d*e^2
*log(c*x^n)/x^2 - 1/3*b*d^2*e*n/x^3 - 3/2*a*d*e^2/x^2 - b*d^2*e*log(c*x^n)/
x^3 - 1/16*b*d^3*n/x^4 - a*d^2*e/x^3 - 1/4*b*d^3*log(c*x^n)/x^4 - 1/4*a*d^3
/x^4
```

mupad [B] time = 3.71, size = 118, normalized size = 1.31

$$-\frac{x^3\left(4\,a\,e^3+4\,b\,e^3\,n\right)+x\left(4\,a\,d^2\,e+\frac{4\,b\,d^2\,e\,n}{3}\right)+a\,d^3+x^2\left(6\,a\,d\,e^2+3\,b\,d\,e^2\,n\right)+\frac{b\,d^3\,n}{4}}{4\,x^4}-\frac{\ln\left(c\,x^n\right)\left(\frac{b\,d^3}{4}+b\,d^2\,e\,x+\right.}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^3)/x^5,x)
```

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

sympy [B] time = 2.99, size = 206, normalized size = 2.29

$$-\frac{ad^3}{4x^4}-\frac{ad^2e}{x^3}-\frac{3ade^2}{2x^2}-\frac{ae^3}{x}-\frac{bd^3n\log(x)}{4x^4}-\frac{bd^3n}{16x^4}-\frac{bd^3\log(c)}{4x^4}-\frac{bd^2en\log(x)}{x^3}-\frac{bd^2en}{3x^3}-\frac{bd^2e\log(c)}{x^3}-\frac{3bde^2n\log(x)}{2x^2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] -a*d**3/(4*x**4) - a*d**2*e/x**3 - 3*a*d*e**2/(2*x**2) - a*e**3/x - b*d**3*
n*log(x)/(4*x**4) - b*d**3*n/(16*x**4) - b*d**3*log(c)/(4*x**4) - b*d**2*e*
n*log(x)/x**3 - b*d**2*e*n/(3*x**3) - b*d**2*e*log(c)/x**3 - 3*b*d*e**2*n*l
og(x)/(2*x**2) - 3*b*d*e**2*n/(4*x**2) - 3*b*d*e**2*log(c)/(2*x**2) - b*e**
3*n*log(x)/x - b*e**3*n/x - b*e**3*log(c)/x
```

3.28 $\int \frac{(d+ex)^3\left(a+b\log(cx^n)\right)}{x^6}\,dx$

Optimal. Leaf size=142

$$\frac{e(d+ex)^4\left(a+b\log\left(cx^n\right)\right)}{20d^2x^4}-\frac{(d+ex)^4\left(a+b\log\left(cx^n\right)\right)}{5dx^5}-\frac{be^5n\log(x)}{20d^2}-\frac{bn(d+ex)^5}{25d^2x^5}+\frac{bd^2en}{80x^4}+\frac{be^4n}{5dx}+\frac{bde^2n}{15x^3}+\frac{3be^3n}{20x^2}$$

```
[Out] 1/80*b*d^2*e*n/x^4+1/15*b*d*e^2*n/x^3+3/20*b*e^3*n/x^2+1/5*b*e^4*n/d/x-1/25
*b*n*(e*x+d)^5/d^2/x^5-1/20*b*e^5*n*ln(x)/d^2-1/5*(e*x+d)^4*(a+b*ln(c*x^n))
/d/x^5+1/20*e*(e*x+d)^4*(a+b*ln(c*x^n))/d^2/x^4
```

Rubi [A] time = 0.10, antiderivative size = 133, normalized size of antiderivative = 0.94, number of steps used = 5, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {45, 37, 2334, 12, 78, 43}

$$-\frac{1}{20}\left(\frac{4(d+ex)^4}{dx^5}-\frac{e(d+ex)^4}{d^2x^4}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{be^5n\log(x)}{20d^2}+\frac{bd^2en}{80x^4}-\frac{bn(d+ex)^5}{25d^2x^5}+\frac{bde^2n}{15x^3}+\frac{be^4n}{5dx}+\frac{3be^3n}{20x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] (b*d^2*e*n)/(80*x^4) + (b*d*e^2*n)/(15*x^3) + (3*b*e^3*n)/(20*x^2) + (b*e^4
*n)/(5*d*x) - (b*n*(d + e*x)^5)/(25*d^2*x^5) - (b*e^5*n*Log[x])/(20*d^2) -
(((4*(d + e*x)^4)/(d*x^5) - (e*(d + e*x)^4)/(d^2*x^4))*(a + b*Log[c*x^n]))/
20
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

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

Rule 43

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

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
```

```
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{x^6}\,dx = -\frac{1}{20}\left(\frac{4(d+ex)^4}{dx^5}-\frac{e(d+ex)^4}{d^2x^4}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{(-4d+ex)(d+ex)^4}{20d^2x^6}$$

$$= -\frac{1}{20}\left(\frac{4(d+ex)^4}{dx^5}-\frac{e(d+ex)^4}{d^2x^4}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int \frac{(-4d+ex)(d+ex)^4}{x^6}\,dx}{20d^2}$$

$$= -\frac{bn(d+ex)^5}{25d^2x^5}-\frac{1}{20}\left(\frac{4(d+ex)^4}{dx^5}-\frac{e(d+ex)^4}{d^2x^4}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(ben)\int \frac{(d+ex}{x^5}}{20d^2}$$

$$= -\frac{bn(d+ex)^5}{25d^2x^5}-\frac{1}{20}\left(\frac{4(d+ex)^4}{dx^5}-\frac{e(d+ex)^4}{d^2x^4}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(ben)\int\left(\frac{d^4}{x^5}+\right.}{}$$

$$= \frac{bd^2en}{80x^4}+\frac{bde^2n}{15x^3}+\frac{3be^3n}{20x^2}+\frac{be^4n}{5dx}-\frac{bn(d+ex)^5}{25d^2x^5}-\frac{be^5n\log(x)}{20d^2}-\frac{1}{20}\left(\frac{4(d+ex)}{dx^5}\right.$$

Mathematica [A] time = 0.05, size = 113, normalized size = 0.80

$$-\frac{60a\left(4d^3+15d^2ex+20de^2x^2+10e^3x^3\right)+60b\left(4d^3+15d^2ex+20de^2x^2+10e^3x^3\right)\log\left(cx^n\right)+bn\left(48d^3+225d^2\right.}{1200x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -1/1200*(60*a*(4*d^3 + 15*d^2*e*x + 20*d*e^2*x^2 + 10*e^3*x^3) + b*n*(48*d^
3 + 225*d^2*e*x + 400*d*e^2*x^2 + 300*e^3*x^3) + 60*b*(4*d^3 + 15*d^2*e*x +
 20*d*e^2*x^2 + 10*e^3*x^3)*Log[c*x^n])/x^5
```

fricas [A] time = 0.49, size = 155, normalized size = 1.09

$$-\frac{48\,bd^3n+240\,ad^3+300\left(be^3n+2\,ae^3\right)x^3+400\left(bde^2n+3\,ade^2\right)x^2+225\left(bd^2en+4\,ad^2e\right)x+60\left(10\,be^3x^3+2\right.}{1200\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/1200*(48*b*d^3*n + 240*a*d^3 + 300*(b*e^3*n + 2*a*e^3)*x^3 + 400*(b*d*e^
2*n + 3*a*d*e^2)*x^2 + 225*(b*d^2*e*n + 4*a*d^2*e)*x + 60*(10*b*e^3*x^3 + 2
0*b*d*e^2*x^2 + 15*b*d^2*e*x + 4*b*d^3)*log(c) + 60*(10*b*e^3*n*x^3 + 20*b*
d*e^2*n*x^2 + 15*b*d^2*e*n*x + 4*b*d^3*n)*log(x))/x^5
```

giac [A] time = 0.36, size = 158, normalized size = 1.11

$$-\frac{600\,bnx^3e^3\log(x) + 1200\,bdnx^2e^2\log(x) + 900\,bd^2nxe\log(x) + 300\,bnx^3e^3 + 400\,bdnx^2e^2 + 225\,bd^2nxe + 6}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] -1/1200*(600*b*n*x^3*e^3*log(x) + 1200*b*d*n*x^2*e^2*log(x) + 900*b*d^2*n*x
*e*log(x) + 300*b*n*x^3*e^3 + 400*b*d*n*x^2*e^2 + 225*b*d^2*n*x*e + 600*b*x
^3*e^3*log(c) + 1200*b*d*x^2*e^2*log(c) + 900*b*d^2*x*e*log(c) + 240*b*d^3*
n*log(x) + 48*b*d^3*n + 600*a*x^3*e^3 + 1200*a*d*x^2*e^2 + 900*a*d^2*x*e +
240*b*d^3*log(c) + 240*a*d^3)/x^5
```

maple [C] time = 0.18, size = 571, normalized size = 4.02

$$-\frac{\left(10e^3x^3 + 20d\,e^2x^2 + 15d^2ex + 4d^3\right)b\ln\left(x^n\right)}{20x^5} - \frac{1200bd\,e^2x^2\ln(c) + 900b\,d^2ex\ln(c) + 1200ad\,e^2x^2 + 900a\,d^2e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(b*ln(c*x^n)+a)/x^6,x)
```

```
[Out] -1/20*b*(10*e^3*x^3+20*d*e^2*x^2+15*d^2*e*x+4*d^3)/x^5*ln(x^n)-1/1200*(1200
*b*d*e^2*x^2*ln(c)+900*b*d^2*e*x*ln(c)+600*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csg
n(I*c*x^n)^2+450*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+1200*a*d*e^2*x^2+
900*a*d^2*e*x+240*a*d^3-300*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)+600*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+450*I*Pi*b*d^2*csgn(I*x^
n)*csgn(I*c*x^n)^2*e*x+600*a*e^3*x^3+48*b*d^3*n+240*b*d^3*ln(c)+600*b*e^3*x
^3*ln(c)-120*I*Pi*b*d^3*csgn(I*c*x^n)^3-450*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)-600*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+300*b*e^3*n*x^3+300*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)+300*I*Pi*b*e
^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-120*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-300*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3+120*I*Pi*b*d^3*csgn(I*x^n)*cs
gn(I*c*x^n)^2+120*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-600*I*Pi*b*d*e^2*x^2
*csgn(I*c*x^n)^3-450*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3+225*b*d^2*e*n*x+400*b*d
*e^2*n*x^2)/x^5
```

maxima [A] time = 0.53, size = 143, normalized size = 1.01

$$-\frac{be^3n}{4\,x^2} - \frac{be^3\log\left(cx^n\right)}{2\,x^2} - \frac{bde^2n}{3\,x^3} - \frac{ae^3}{2\,x^2} - \frac{bde^2\log\left(cx^n\right)}{x^3} - \frac{3\,bd^2en}{16\,x^4} - \frac{ade^2}{x^3} - \frac{3\,bd^2e\log\left(cx^n\right)}{4\,x^4} - \frac{bd^3n}{25\,x^5} - \frac{3\,ad^2e}{4\,x^4} - \frac{bd^3\log\left(c\right.}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] -1/4*b*e^3*n/x^2 - 1/2*b*e^3*log(c*x^n)/x^2 - 1/3*b*d*e^2*n/x^3 - 1/2*a*e^3
/x^2 - b*d*e^2*log(c*x^n)/x^3 - 3/16*b*d^2*e*n/x^4 - a*d*e^2/x^3 - 3/4*b*d^
2*e*log(c*x^n)/x^4 - 1/25*b*d^3*n/x^5 - 3/4*a*d^2*e/x^4 - 1/5*b*d^3*log(c*x
^n)/x^5 - 1/5*a*d^3/x^5
```

mupad [B] time = 3.58, size = 120, normalized size = 0.85

$$-\frac{x^3\left(10\,a\,e^3 + 5\,b\,e^3\,n\right) + x\left(15\,a\,d^2\,e + \frac{15\,b\,d^2\,e\,n}{4}\right) + 4\,a\,d^3 + x^2\left(20\,a\,d\,e^2 + \frac{20\,b\,d\,e^2\,n}{3}\right) + \frac{4\,b\,d^3\,n}{5}}{20\,x^5} - \frac{\ln\left(c\,x^n\right)\left(\frac{b\,d^3}{5} + \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^3)/x^6,x)
```

```
[Out] - (x^3*(10*a*e^3 + 5*b*e^3*n) + x*(15*a*d^2*e + (15*b*d^2*e*n)/4) + 4*a*d^3
 + x^2*(20*a*d*e^2 + (20*b*d*e^2*n)/3) + (4*b*d^3*n)/5)/(20*x^5) - (log(c*x
^n)*((b*d^3)/5 + (b*e^3*x^3)/2 + (3*b*d^2*e*x)/4 + b*d*e^2*x^2))/x^5
```

sympy [A] time = 4.65, size = 219, normalized size = 1.54

$$-\frac{ad^3}{5x^5}-\frac{3ad^2e}{4x^4}-\frac{ade^2}{x^3}-\frac{ae^3}{2x^2}-\frac{bd^3n\log(x)}{5x^5}-\frac{bd^3n}{25x^5}-\frac{bd^3\log(c)}{5x^5}-\frac{3bd^2en\log(x)}{4x^4}-\frac{3bd^2en}{16x^4}-\frac{3bd^2e\log(c)}{4x^4}-\frac{bde^2n\log(x)}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] -a*d**3/(5*x**5) - 3*a*d**2*e/(4*x**4) - a*d*e**2/x**3 - a*e**3/(2*x**2) -
b*d**3*n*log(x)/(5*x**5) - b*d**3*n/(25*x**5) - b*d**3*log(c)/(5*x**5) - 3*
b*d**2*e*n*log(x)/(4*x**4) - 3*b*d**2*e*n/(16*x**4) - 3*b*d**2*e*log(c)/(4*
x**4) - b*d*e**2*n*log(x)/x**3 - b*d*e**2*n/(3*x**3) - b*d*e**2*log(c)/x**3
 - b*e**3*n*log(x)/(2*x**2) - b*e**3*n/(4*x**2) - b*e**3*log(c)/(2*x**2)
```

3.29 $\int \frac{(d+ex)^3\left(a+b\log(cx^n)\right)}{x^7}\,dx$

Optimal. Leaf size=133

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{6x^6}-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{3de^2\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{e^3\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{bd^3n}{36x^6}-\frac{3bd^2en}{25x^5}-\frac{3bd}{16}$$

```
[Out] -1/36*b*d^3*n/x^6-3/25*b*d^2*e*n/x^5-3/16*b*d*e^2*n/x^4-1/9*b*e^3*n/x^3-1/6
*d^3*(a+b*ln(c*x^n))/x^6-3/5*d^2*e*(a+b*ln(c*x^n))/x^5-3/4*d*e^2*(a+b*ln(c*
x^n))/x^4-1/3*e^3*(a+b*ln(c*x^n))/x^3
```

Rubi [A] time = 0.10, antiderivative size = 100, normalized size of antiderivative = 0.75, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 2334, 12, 14}

$$-\frac{1}{60}\left(\frac{36d^2e}{x^5}+\frac{10d^3}{x^6}+\frac{45de^2}{x^4}+\frac{20e^3}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2en}{25x^5}-\frac{bd^3n}{36x^6}-\frac{3bde^2n}{16x^4}-\frac{be^3n}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^3*(a + b*Log[c*x^n]))/x^7,x]
```

```
[Out] -(b*d^3*n)/(36*x^6) - (3*b*d^2*e*n)/(25*x^5) - (3*b*d*e^2*n)/(16*x^4) - (b*
e^3*n)/(9*x^3) - (((10*d^3)/x^6 + (36*d^2*e)/x^5 + (45*d*e^2)/x^4 + (20*e^3
)/x^3)*(a + b*Log[c*x^n]))/60
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{x^7}\,dx = -\frac{1}{60}\left(\frac{10d^3}{x^6}+\frac{36d^2e}{x^5}+\frac{45de^2}{x^4}+\frac{20e^3}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-10d^3-36d}{}$$

$$= -\frac{1}{60}\left(\frac{10d^3}{x^6}+\frac{36d^2e}{x^5}+\frac{45de^2}{x^4}+\frac{20e^3}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int \frac{-10d^3-3}{}$$

$$= -\frac{1}{60}\left(\frac{10d^3}{x^6}+\frac{36d^2e}{x^5}+\frac{45de^2}{x^4}+\frac{20e^3}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int\left(-\frac{10d^3}{x^7}\right.$$

$$= -\frac{bd^3n}{36x^6}-\frac{3bd^2en}{25x^5}-\frac{3bde^2n}{16x^4}-\frac{be^3n}{9x^3}-\frac{1}{60}\left(\frac{10d^3}{x^6}+\frac{36d^2e}{x^5}+\frac{45de^2}{x^4}+\frac{20e^3}{x^3}\right)(a$$

Mathematica [A] time = 0.06, size = 113, normalized size = 0.85

$$-\frac{60a\left(10d^3+36d^2ex+45de^2x^2+20e^3x^3\right)+60b\left(10d^3+36d^2ex+45de^2x^2+20e^3x^3\right)\log\left(cx^n\right)+bn\left(100d^3+43\right.}{3600x^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^3*(a + b*Log[c*x^n]))/x^7,x]
```

```
[Out] -1/3600*(60*a*(10*d^3 + 36*d^2*e*x + 45*d*e^2*x^2 + 20*e^3*x^3) + b*n*(100*
d^3 + 432*d^2*e*x + 675*d*e^2*x^2 + 400*e^3*x^3) + 60*b*(10*d^3 + 36*d^2*e*
x + 45*d*e^2*x^2 + 20*e^3*x^3)*Log[c*x^n])/x^6
```

fricas [A] time = 0.48, size = 155, normalized size = 1.17

$$-\frac{100\,bd^3n+600\,ad^3+400\left(be^3n+3\,ae^3\right)x^3+675\left(bde^2n+4\,ade^2\right)x^2+432\left(bd^2en+5\,ad^2e\right)x+60\left(20\,be^3x^3+\right.}{3600\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^7,x, algorithm="fricas")
```

```
[Out] -1/3600*(100*b*d^3*n + 600*a*d^3 + 400*(b*e^3*n + 3*a*e^3)*x^3 + 675*(b*d*e
^2*n + 4*a*d*e^2)*x^2 + 432*(b*d^2*e*n + 5*a*d^2*e)*x + 60*(20*b*e^3*x^3 +
45*b*d*e^2*x^2 + 36*b*d^2*e*x + 10*b*d^3)*log(c) + 60*(20*b*e^3*n*x^3 + 45*
b*d*e^2*n*x^2 + 36*b*d^2*e*n*x + 10*b*d^3*n)*log(x))/x^6
```

giac [A] time = 0.31, size = 158, normalized size = 1.19

$$-\frac{1200\,bnx^3e^3\log(x)+2700\,bdnx^2e^2\log(x)+2160\,bd^2nxe\log(x)+400\,bnx^3e^3+675\,bdnx^2e^2+432\,bd^2nxe+12}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^7,x, algorithm="giac")
```

```
[Out] -1/3600*(1200*b*n*x^3*e^3*log(x) + 2700*b*d*n*x^2*e^2*log(x) + 2160*b*d^2*n
*x*e*log(x) + 400*b*n*x^3*e^3 + 675*b*d*n*x^2*e^2 + 432*b*d^2*n*x*e + 1200*
b*x^3*e^3*log(c) + 2700*b*d*x^2*e^2*log(c) + 2160*b*d^2*x*e*log(c) + 600*b*
d^3*n*log(x) + 100*b*d^3*n + 1200*a*x^3*e^3 + 2700*a*d*x^2*e^2 + 2160*a*d^2
*x*e + 600*b*d^3*log(c) + 600*a*d^3)/x^6
```

maple [C] time = 0.18, size = 571, normalized size = 4.29

$$-\frac{\left(20e^3x^3+45d\,e^2x^2+36d^2ex+10d^3\right)b\ln\left(x^n\right)}{60x^6}-\frac{2700bd\,e^2x^2\ln(c)+2160b\,d^2ex\ln(c)+2700ad\,e^2x^2+2160a\,d^2e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(b*ln(c*x^n)+a)/x^7,x)
```

```
[Out] -1/60*b*(20*e^3*x^3+45*d*e^2*x^2+36*d^2*e*x+10*d^3)/x^6*ln(x^n)-1/3600*(270
0*b*d*e^2*x^2*ln(c)+2160*b*d^2*e*x*ln(c)+1350*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*
csgn(I*c*x^n)^2+1080*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+2700*a*d*e^2*
x^2+2160*a*d^2*e*x+600*a*d^3-600*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)+1350*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1080*I*Pi*b*d^2*cs
gn(I*x^n)*csgn(I*c*x^n)^2*e*x+1200*a*e^3*x^3+100*b*d^3*n+600*b*d^3*ln(c)+12
00*b*e^3*x^3*ln(c)-1350*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)-300*I*Pi*b*d^3*csgn(I*c*x^n)^3-1080*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+400*b*e^3*n*x^3+600*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)+
600*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-300*I*Pi*b*d^3*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)-600*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3+300*I*Pi*b*d^3*cs
gn(I*x^n)*csgn(I*c*x^n)^2+300*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-1350*I*P
i*b*d*e^2*x^2*csgn(I*c*x^n)^3-1080*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3+432*b*d^2
*e*n*x+675*b*d*e^2*n*x^2)/x^6
```

maxima [A] time = 0.61, size = 143, normalized size = 1.08

$$-\frac{be^3n}{9\,x^3}-\frac{be^3\log\left(cx^n\right)}{3\,x^3}-\frac{3\,bde^2n}{16\,x^4}-\frac{ae^3}{3\,x^3}-\frac{3\,bde^2\log\left(cx^n\right)}{4\,x^4}-\frac{3\,bd^2en}{25\,x^5}-\frac{3\,ade^2}{4\,x^4}-\frac{3\,bd^2e\log\left(cx^n\right)}{5\,x^5}-\frac{bd^3n}{36\,x^6}-\frac{3\,ad^2e}{5\,x^5}-\frac{bd^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^7,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^3*n/x^3 - 1/3*b*e^3*log(c*x^n)/x^3 - 3/16*b*d*e^2*n/x^4 - 1/3*a*e^
3/x^3 - 3/4*b*d*e^2*log(c*x^n)/x^4 - 3/25*b*d^2*e*n/x^5 - 3/4*a*d*e^2/x^4 -
 3/5*b*d^2*e*log(c*x^n)/x^5 - 1/36*b*d^3*n/x^6 - 3/5*a*d^2*e/x^5 - 1/6*b*d^
3*log(c*x^n)/x^6 - 1/6*a*d^3/x^6
```

mupad [B] time = 3.74, size = 121, normalized size = 0.91

$$-\frac{x^3\left(20\,a\,e^3+\frac{20\,b\,e^3\,n}{3}\right)+x\left(36\,a\,d^2\,e+\frac{36\,b\,d^2\,e\,n}{5}\right)+10\,a\,d^3+x^2\left(45\,a\,d\,e^2+\frac{45\,b\,d\,e^2\,n}{4}\right)+\frac{5\,b\,d^3\,n}{3}}{60\,x^6}-\frac{\ln\left(c\,x^n\right)\left(\frac{b\,d^3}{6}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^3)/x^7,x)
```

```
[Out] - (x^3*(20*a*e^3 + (20*b*e^3*n)/3) + x*(36*a*d^2*e + (36*b*d^2*e*n)/5) + 10
*a*d^3 + x^2*(45*a*d*e^2 + (45*b*d*e^2*n)/4) + (5*b*d^3*n)/3)/(60*x^6) - (l
og(c*x^n)*((b*d^3)/6 + (b*e^3*x^3)/3 + (3*b*d^2*e*x)/5 + (3*b*d*e^2*x^2)/4)
)/x^6
```

sympy [A] time = 7.12, size = 231, normalized size = 1.74

$$-\frac{ad^3}{6x^6}-\frac{3ad^2e}{5x^5}-\frac{3ade^2}{4x^4}-\frac{ae^3}{3x^3}-\frac{bd^3n\log\left(x\right)}{6x^6}-\frac{bd^3n}{36x^6}-\frac{bd^3\log\left(c\right)}{6x^6}-\frac{3bd^2en\log\left(x\right)}{5x^5}-\frac{3bd^2en}{25x^5}-\frac{3bd^2e\log\left(c\right)}{5x^5}-\frac{3bde^2n\log}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))/x**7,x)
```

```
[Out] -a*d**3/(6*x**6) - 3*a*d**2*e/(5*x**5) - 3*a*d*e**2/(4*x**4) - a*e**3/(3*x*
*3) - b*d**3*n*log(x)/(6*x**6) - b*d**3*n/(36*x**6) - b*d**3*log(c)/(6*x**6
) - 3*b*d**2*e*n*log(x)/(5*x**5) - 3*b*d**2*e*n/(25*x**5) - 3*b*d**2*e*log(
c)/(5*x**5) - 3*b*d*e**2*n*log(x)/(4*x**4) - 3*b*d*e**2*n/(16*x**4) - 3*b*d
*e**2*log(c)/(4*x**4) - b*e**3*n*log(x)/(3*x**3) - b*e**3*n/(9*x**3) - b*e*
*3*log(c)/(3*x**3)
```

3.30 $\int \frac{(d+ex)^3\left(a+b\log(cx^n)\right)}{x^8}\,dx$

Optimal. Leaf size=133

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{7x^7}-\frac{d^2e\left(a+b\log\left(cx^n\right)\right)}{2x^6}-\frac{3de^2\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{e^3\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{bd^3n}{49x^7}-\frac{bd^2en}{12x^6}-\frac{3bde^2n}{25x^5}-$$

```
[Out] -1/49*b*d^3*n/x^7-1/12*b*d^2*e*n/x^6-3/25*b*d*e^2*n/x^5-1/16*b*e^3*n/x^4-1/
7*d^3*(a+b*ln(c*x^n))/x^7-1/2*d^2*e*(a+b*ln(c*x^n))/x^6-3/5*d*e^2*(a+b*ln(c
*x^n))/x^5-1/4*e^3*(a+b*ln(c*x^n))/x^4
```

Rubi [A] time = 0.11, antiderivative size = 100, normalized size of antiderivative = 0.75, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {43, 2334, 12, 14}

$$-\frac{1}{140}\left(\frac{70d^2e}{x^6}+\frac{20d^3}{x^7}+\frac{84de^2}{x^5}+\frac{35e^3}{x^4}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2en}{12x^6}-\frac{bd^3n}{49x^7}-\frac{3bde^2n}{25x^5}-\frac{be^3n}{16x^4}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^3*n)/(49*x^7) - (b*d^2*e*n)/(12*x^6) - (3*b*d*e^2*n)/(25*x^5) - (b*e^
3*n)/(16*x^4) - (((20*d^3)/x^7 + (70*d^2*e)/x^6 + (84*d*e^2)/x^5 + (35*e^3)
/x^4)*(a + b*Log[c*x^n]))/140
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

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

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{x^8}\,dx = -\frac{1}{140}\left(\frac{20d^3}{x^7}+\frac{70d^2e}{x^6}+\frac{84de^2}{x^5}+\frac{35e^3}{x^4}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-20d^3-$$
$$= -\frac{1}{140}\left(\frac{20d^3}{x^7}+\frac{70d^2e}{x^6}+\frac{84de^2}{x^5}+\frac{35e^3}{x^4}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{140}(bn)\int \frac{-20$$
$$= -\frac{1}{140}\left(\frac{20d^3}{x^7}+\frac{70d^2e}{x^6}+\frac{84de^2}{x^5}+\frac{35e^3}{x^4}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{140}(bn)\int\left(-\frac{2}{}\right.$$
$$= -\frac{bd^3n}{49x^7}-\frac{bd^2en}{12x^6}-\frac{3bde^2n}{25x^5}-\frac{be^3n}{16x^4}-\frac{1}{140}\left(\frac{20d^3}{x^7}+\frac{70d^2e}{x^6}+\frac{84de^2}{x^5}+\frac{35e^3}{x^4}\right)($$

Mathematica [A] time = 0.06, size = 113, normalized size = 0.85

$$-\frac{420a\left(20d^3+70d^2ex+84de^2x^2+35e^3x^3\right)+420b\left(20d^3+70d^2ex+84de^2x^2+35e^3x^3\right)\log\left(cx^n\right)+bn\left(1200\right.}{58800x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -1/58800*(420*a*(20*d^3 + 70*d^2*e*x + 84*d*e^2*x^2 + 35*e^3*x^3) + b*n*(12
00*d^3 + 4900*d^2*e*x + 7056*d*e^2*x^2 + 3675*e^3*x^3) + 420*b*(20*d^3 + 70
*d^2*e*x + 84*d*e^2*x^2 + 35*e^3*x^3)*Log[c*x^n])/x^7
```

fricas [A] time = 0.47, size = 155, normalized size = 1.17

$$-\frac{1200\,bd^3n+8400\,ad^3+3675\left(be^3n+4\,ae^3\right)x^3+7056\left(bde^2n+5\,ade^2\right)x^2+4900\left(bd^2en+6\,ad^2e\right)x+420\left(3\right.}{588}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")
```

```
[Out] -1/58800*(1200*b*d^3*n + 8400*a*d^3 + 3675*(b*e^3*n + 4*a*e^3)*x^3 + 7056*(
b*d*e^2*n + 5*a*d*e^2)*x^2 + 4900*(b*d^2*e*n + 6*a*d^2*e)*x + 420*(35*b*e^3
*x^3 + 84*b*d*e^2*x^2 + 70*b*d^2*e*x + 20*b*d^3)*log(c) + 420*(35*b*e^3*n*x
^3 + 84*b*d*e^2*n*x^2 + 70*b*d^2*e*n*x + 20*b*d^3*n)*log(x))/x^7
```

giac [A] time = 0.46, size = 158, normalized size = 1.19

$$-\frac{14700\,bnx^3e^3\log(x)+35280\,bdnx^2e^2\log(x)+29400\,bd^2nxe\log(x)+3675\,bnx^3e^3+7056\,bdnx^2e^2+4900\,b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="giac")
```

```
[Out] -1/58800*(14700*b*n*x^3*e^3*log(x) + 35280*b*d*n*x^2*e^2*log(x) + 29400*b*d
^2*n*x*e*log(x) + 3675*b*n*x^3*e^3 + 7056*b*d*n*x^2*e^2 + 4900*b*d^2*n*x*e
+ 14700*b*x^3*e^3*log(c) + 35280*b*d*x^2*e^2*log(c) + 29400*b*d^2*x*e*log(c
) + 8400*b*d^3*n*log(x) + 1200*b*d^3*n + 14700*a*x^3*e^3 + 35280*a*d*x^2*e^
2 + 29400*a*d^2*x*e + 8400*b*d^3*log(c) + 8400*a*d^3)/x^7
```

maple [C] time = 0.18, size = 571, normalized size = 4.29

$$-\frac{\left(35e^3x^3+84d\,e^2x^2+70d^2ex+20d^3\right)b\ln\left(x^n\right)}{140x^7}-\frac{35280bd\,e^2x^2\ln(c)+29400b\,d^2ex\ln(c)+35280ad\,e^2x^2+29}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(b*ln(c*x^n)+a)/x^8,x)
```

```
[Out] -1/140*b*(35*e^3*x^3+84*d*e^2*x^2+70*d^2*e*x+20*d^3)/x^7*ln(x^n)-1/58800*(-
17640*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-14700*I*Pi*b*d^2
*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+35280*b*d*e^2*x^2*ln(c)+29400*b*d^
2*e*x*ln(c)+14700*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*e*x+35280*a*d*e^2*
x^2+29400*a*d^2*e*x+8400*a*d^3+17640*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(
I*c)+14700*a*e^3*x^3+1200*b*d^3*n+8400*b*d^3*ln(c)+14700*b*e^3*x^3*ln(c)-42
00*I*Pi*b*d^3*csgn(I*c*x^n)^3+3675*b*e^3*n*x^3-7350*I*Pi*b*e^3*x^3*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)+17640*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n
)^2+14700*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+7350*I*Pi*b*e^3*x^3*csgn
(I*x^n)*csgn(I*c*x^n)^2-7350*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3+4200*I*Pi*b*d^3
*csgn(I*x^n)*csgn(I*c*x^n)^2+4200*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+7350
*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-4200*I*Pi*b*d^3*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)-17640*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3-14700*I*Pi*b*d^2*
e*x*csgn(I*c*x^n)^3+4900*b*d^2*e*n*x+7056*b*d*e^2*n*x^2)/x^7
```

maxima [A] time = 0.57, size = 143, normalized size = 1.08

$$-\frac{be^3n}{16\,x^4}-\frac{be^3\log\left(cx^n\right)}{4\,x^4}-\frac{3\,bde^2n}{25\,x^5}-\frac{ae^3}{4\,x^4}-\frac{3\,bde^2\log\left(cx^n\right)}{5\,x^5}-\frac{bd^2en}{12\,x^6}-\frac{3\,ade^2}{5\,x^5}-\frac{bd^2e\log\left(cx^n\right)}{2\,x^6}-\frac{bd^3n}{49\,x^7}-\frac{ad^2e}{2\,x^6}-\frac{bd^3\log\left(cx^n\right.}{7\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")
```

```
[Out] -1/16*b*e^3*n/x^4 - 1/4*b*e^3*log(c*x^n)/x^4 - 3/25*b*d*e^2*n/x^5 - 1/4*a*e
^3/x^4 - 3/5*b*d*e^2*log(c*x^n)/x^5 - 1/12*b*d^2*e*n/x^6 - 3/5*a*d*e^2/x^5
- 1/2*b*d^2*e*log(c*x^n)/x^6 - 1/49*b*d^3*n/x^7 - 1/2*a*d^2*e/x^6 - 1/7*b*d
^3*log(c*x^n)/x^7 - 1/7*a*d^3/x^7
```

mupad [B] time = 3.59, size = 121, normalized size = 0.91

$$-\frac{x^3\left(35\,a\,e^3+\frac{35\,b\,e^3\,n}{4}\right)+x\left(70\,a\,d^2\,e+\frac{35\,b\,d^2\,e\,n}{3}\right)+20\,a\,d^3+x^2\left(84\,a\,d\,e^2+\frac{84\,b\,d\,e^2\,n}{5}\right)+\frac{20\,b\,d^3\,n}{7}}{140\,x^7}-\frac{\ln\left(c\,x^n\right)\left(\frac{b\,d^3}{7}+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^3)/x^8,x)
```

```
[Out] - (x^3*(35*a*e^3 + (35*b*e^3*n)/4) + x*(70*a*d^2*e + (35*b*d^2*e*n)/3) + 20
*a*d^3 + x^2*(84*a*d*e^2 + (84*b*d*e^2*n)/5) + (20*b*d^3*n)/7)/(140*x^7) -
(log(c*x^n)*((b*d^3)/7 + (b*e^3*x^3)/4 + (b*d^2*e*x)/2 + (3*b*d*e^2*x^2)/5)
)/x^7
```

sympy [A] time = 10.56, size = 224, normalized size = 1.68

$$-\frac{ad^3}{7x^7}-\frac{ad^2e}{2x^6}-\frac{3ade^2}{5x^5}-\frac{ae^3}{4x^4}-\frac{bd^3n\log\left(x\right)}{7x^7}-\frac{bd^3n}{49x^7}-\frac{bd^3\log\left(c\right)}{7x^7}-\frac{bd^2en\log\left(x\right)}{2x^6}-\frac{bd^2en}{12x^6}-\frac{bd^2e\log\left(c\right)}{2x^6}-\frac{3bde^2n\log\left(x\right)}{5x^5}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] -a*d**3/(7*x**7) - a*d**2*e/(2*x**6) - 3*a*d*e**2/(5*x**5) - a*e**3/(4*x**4
) - b*d**3*n*log(x)/(7*x**7) - b*d**3*n/(49*x**7) - b*d**3*log(c)/(7*x**7)
- b*d**2*e*n*log(x)/(2*x**6) - b*d**2*e*n/(12*x**6) - b*d**2*e*log(c)/(2*x*
*6) - 3*b*d*e**2*n*log(x)/(5*x**5) - 3*b*d*e**2*n/(25*x**5) - 3*b*d*e**2*lo
g(c)/(5*x**5) - b*e**3*n*log(x)/(4*x**4) - b*e**3*n/(16*x**4) - b*e**3*log(
c)/(4*x**4)
```

3.31 $\int \frac{x^3(a+b\log(cx^n))}{d+ex}\,dx$

Optimal. Leaf size=148

$$-\frac{d^3\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e}+\frac{ad^2x}{e^3}+\frac{bd^2x\log\left(cx^n\right)}{e^3}-\frac{bd^3n\mathrm{Li}_2}{e^4}$$

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

Rubi [A] time = 0.18, antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {43, 2351, 2295, 2304, 2317, 2391}

$$-\frac{bd^3n\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}-\frac{d^3\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e}+\frac{ad^2x}{e^3}+$$

Antiderivative was successfully verified.

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

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

Rule 43

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

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{d+ex}\,dx = \int\left(\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3}-\frac{dx\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{e}-\frac{d^3\left(a+b\log\right.}{e^3(d+e}\right.$$

$$=\frac{d^2\int\left(a+b\log\left(cx^n\right)\right)dx}{e^3}-\frac{d^3\int\frac{a+b\log(cx^n)}{d+ex}dx}{e^3}-\frac{d\int x\left(a+b\log\left(cx^n\right)\right)dx}{e^2}+\frac{\int x^2\left(a\right.}{}$$

$$=\frac{ad^2x}{e^3}+\frac{bdnx^2}{4e^2}-\frac{bnx^3}{9e}-\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e}-\frac{d^3\left(a+b\log\right.}{}$$

$$=\frac{ad^2x}{e^3}-\frac{bd^2nx}{e^3}+\frac{bdnx^2}{4e^2}-\frac{bnx^3}{9e}+\frac{bd^2x\log\left(cx^n\right)}{e^3}-\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{x^3\left(a+b\right.}{3}$$

Mathematica [A] time = 0.08, size = 142, normalized size = 0.96

$$\frac{-36ad^3\log\left(\frac{ex}{d}+1\right)+36ad^2ex-18ade^2x^2+12ae^3x^3+6b\log\left(cx^n\right)\left(ex\left(6d^2-3dex+2e^2x^2\right)-6d^3\log\left(\frac{ex}{d}+1\right)\right)}{36e^4}$$

Antiderivative was successfully verified.

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

```
[Out] (36*a*d^2*e*x - 36*b*d^2*e*n*x - 18*a*d*e^2*x^2 + 9*b*d*e^2*n*x^2 + 12*a*e^
3*x^3 - 4*b*e^3*n*x^3 - 36*a*d^3*Log[1 + (e*x)/d] + 6*b*Log[c*x^n]*(e*x*(6*
d^2 - 3*d*e*x + 2*e^2*x^2) - 6*d^3*Log[1 + (e*x)/d]) - 36*b*d^3*n*PolyLog[2
, -((e*x)/d)])/(36*e^4)
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^3}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.23, size = 693, normalized size = 4.68

$$\frac{b\,d^2x\ln(c)}{e^3}-\frac{b\,d^3\ln(c)\ln(ex+d)}{e^4}-\frac{bd\,x^2\ln(c)}{2e^2}+\frac{a\,x^3}{3e}+\frac{b\,d^3n\,\mathrm{dilog}\left(-\frac{ex}{d}\right)}{e^4}-\frac{i\pi b\,x^3\mathrm{csgn}\left(ic\,x^n\right)^3}{6e}+\frac{b\,d^2x\ln\left(x^n\right)}{e^3}-\frac{b\,d^3\,\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*x^2*d-1/2*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)^2*d^3/e^4*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^3/e^
4*ln(e*x+d)+b*ln(c)/e^3*x*d^2-b*ln(c)*d^3/e^4*ln(e*x+d)-1/2*b*ln(c)/e^2*x^2
*d+b*n*d^3/e^4*dilog(-1/d*e*x)+1/3*a/e*x^3+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2/e*x^3-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^3*x*d^2+1/4*I*b*Pi*csgn(I*c*x^n)^
3/e^2*x^2*d+1/2*I*b*Pi*csgn(I*c*x^n)^3*d^3/e^4*ln(e*x+d)+1/6*I*b*Pi*csgn(I*
c*x^n)^2*csgn(I*c)/e*x^3+b*ln(x^n)/e^3*x*d^2-b*ln(x^n)*d^3/e^4*ln(e*x+d)-1/
2*b*ln(x^n)/e^2*x^2*d+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^3*x*d^2+1/2*
I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^3*x*d^2-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(
I*c)/e^2*x^2*d-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e*x^3-49/36*b
*n*d^3/e^4+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^3/e^4*ln(e*x+d)
+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*x^2*d-1/2*I*b*Pi*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^3*x*d^2-1/2*a/e^2*x^2*d-a*d^3/e^4*ln(e*x+d)
+1/3*b*ln(c)/e*x^3+b*n*d^3/e^4*ln(e*x+d)*ln(-1/d*e*x)+1/3*b*ln(x^n)/e*x^3-1
/6*I*b*Pi*csgn(I*c*x^n)^3/e*x^3-1/9*b*n*x^3/e-b*d^2*n*x/e^3+a*d^2*x/e^3+1/4
*b*d*n*x^2/e^2
```

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

$$-\frac{1}{6}\,a\left(\frac{6\,d^3\log\left(ex+d\right)}{e^4}-\frac{2\,e^2x^3-3\,dex^2+6\,d^2x}{e^3}\right)+b\int\frac{x^3\log(c)+x^3\log\left(x^n\right)}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 38.90, size = 248, normalized size = 1.68

$$-\frac{ad^3\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{e^3}+\frac{ad^2x}{e^3}-\frac{adx^2}{2e^2}+\frac{ax^3}{3e}+\frac{bd^3n\left(\begin{cases}\frac{x}{d} \\ \frac{\begin{cases}\log(d)\log(x)-\mathrm{Li}_2\left(\frac{exe^{i\pi}}{d}\right) \\ -\log(d)\log\left(\frac{1}{x}\right)-\mathrm{Li}_2\left(\frac{exe^{i\pi}}{d}\right) \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\mathrm{lo}\ldots\end{cases}}{e}\end{cases}\right)}{e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d**3*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**3 + a*d**2*x/
e**3 - a*d*x**2/(2*e**2) + a*x**3/(3*e) + b*d**3*n*Piecewise((x/d, Eq(e, 0)
), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) <
1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (
-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((),
 (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d), True))/e, True))/e
**3 - b*d**3*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)
/e**3 - b*d**2*n*x/e**3 + b*d**2*x*log(c*x**n)/e**3 + b*d*n*x**2/(4*e**2) -
 b*d*x**2*log(c*x**n)/(2*e**2) - b*n*x**3/(9*e) + b*x**3*log(c*x**n)/(3*e)
```

3.32 $\int \frac{x^2(a+b\log(cx^n))}{d+ex}\,dx$

Optimal. Leaf size=107

$$\frac{d^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e}-\frac{adx}{e^2}-\frac{bdx\log\left(cx^n\right)}{e^2}+\frac{bd^2n\text{Li}_2\left(-\frac{ex}{d}\right)}{e^3}+\frac{bdnx}{e^2}-\frac{bnx^2}{4e}$$

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

Rubi [A] time = 0.14, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {43, 2351, 2295, 2304, 2317, 2391}

$$\frac{bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}+\frac{d^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e}-\frac{adx}{e^2}-\frac{bdx\log\left(cx^n\right)}{e^2}+\frac{bdnx}{e^2}-\frac{bn}{4}$$

Antiderivative was successfully verified.

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

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

Rule 43

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

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\begin{aligned}\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d+ex}\,dx &= \int\left(-\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{e}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)}\right)dx\\ &= -\frac{d\int\left(a+b\log\left(cx^n\right)\right)dx}{e^2}+\frac{d^2\int\frac{a+b\log(cx^n)}{d+ex}\,dx}{e^2}+\frac{\int x\left(a+b\log\left(cx^n\right)\right)dx}{e}\\ &= -\frac{adx}{e^2}-\frac{bnx^2}{4e}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e^3}-\frac{(bd)\int\log}{e^2}\\ &= -\frac{adx}{e^2}+\frac{bdnx}{e^2}-\frac{bnx^2}{4e}-\frac{bdx\log\left(cx^n\right)}{e^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)\mathrm{lo}}{e^3}\end{aligned}$$

Mathematica [A] time = 0.05, size = 105, normalized size = 0.98

$$\frac{4ad^2\log\left(\frac{ex}{d}+1\right)-4adex+2ae^2x^2+2b\log\left(cx^n\right)\left(2d^2\log\left(\frac{ex}{d}+1\right)+ex(ex-2d)\right)+4bd^2n\mathrm{Li}_2\left(-\frac{ex}{d}\right)+4bdenx-}{4e^3}$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bx^2\log\left(cx^n\right)+ax^2}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x^2}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.21, size = 521, normalized size = 4.87

$$-\frac{bdx\ln\left(x^n\right)}{e^2}+\frac{b\,d^2\ln\left(x^n\right)\ln\left(ex+d\right)}{e^3}-\frac{b\,d^2n\ln\left(-\frac{ex}{d}\right)\ln\left(ex+d\right)}{e^3}+\frac{b\,d^2\ln(c)\ln\left(ex+d\right)}{e^3}-\frac{bdx\ln(c)}{e^2}-\frac{b\,d^2n\,\mathrm{dilog}\left(-\right.}{e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*ln(x^n)/e^2*x*d+b*ln(x^n)*d^2/e^3*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*d^2/e^3*ln(e*x+d)-b*n*d^2/e^3*ln(e*x+d)*ln(-1/d*e*x)+1/4
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*x^2+1/2*I*b*Pi*csgn(I*c*x^n)^3/e^2*x*
d+b*ln(c)*d^2/e^3*ln(e*x+d)-b*n*d^2/e^3*dilog(-1/d*e*x)-b*ln(c)/e^2*x*d-1/4
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e*x^2+1/2*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)^2*d^2/e^3*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*
x*d+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^3*ln(e*x+d)+1/2*a/e*x^2-1/2*
I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*x*d-1/2*I*b*Pi*csgn(I*c*x^n)^3*d^2/e^3
*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*x*d+1/2*b*ln(
x^n)/e*x^2-1/4*I*b*Pi*csgn(I*c*x^n)^3/e*x^2+5/4*b*n*d^2/e^3+a*d^2/e^3*ln(e*
x+d)+1/2*b*ln(c)/e*x^2+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x^2-1/4*b*n*x
^2/e+b*d*n*x/e^2-a*d*x/e^2
```

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

$$\frac{1}{2}\,a\left(\frac{2\,d^2\log\left(ex+d\right)}{e^3}+\frac{ex^2-2\,dx}{e^2}\right)+b\int\frac{x^2\log(c)+x^2\log\left(x^n\right)}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 32.81, size = 199, normalized size = 1.86

$$\frac{ad^2\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{e^2}-\frac{adx}{e^2}+\frac{ax^2}{2e}-\frac{bd^2n\left(\begin{cases}\frac{x}{d}\\ \frac{\begin{cases}\log(d)\log(x)-\operatorname{Li}_2\left(\frac{exe^{i\pi}}{d}\right)\\ -\log(d)\log\left(\frac{1}{x}\right)-\operatorname{Li}_2\left(\frac{exe^{i\pi}}{d}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle|x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle|x\right)\log(d)-\text{L}\end{cases}}{e}\end{cases}\right)}{e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**2 - a*d*x/e**2
 + a*x**2/(2*e) - b*d**2*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*lo
g(x) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) -
polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), (
(0, 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - po
```

```
lylog(2, e*x*exp_polar(I*pi)/d), True))/e, True))/e**2 + b*d**2*Piecewise((
x/d, Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/e**2 + b*d*n*x/e**2 - b
*d*x*log(c*x**n)/e**2 - b*n*x**2/(4*e) + b*x**2*log(c*x**n)/(2*e)
```

3.33 $\int \frac{x(a+b\log(cx^n))}{d+ex}\,dx$

Optimal. Leaf size=69

$$-\frac{d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{ax}{e}+\frac{bx\log\left(cx^n\right)}{e}-\frac{bdn\text{Li}_2\left(-\frac{ex}{d}\right)}{e^2}-\frac{bnx}{e}$$

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

Rubi [A] time = 0.09, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {43, 2351, 2295, 2317, 2391}

$$-\frac{bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^2}-\frac{d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{ax}{e}+\frac{bx\log\left(cx^n\right)}{e}-\frac{bnx}{e}$$

Antiderivative was successfully verified.

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

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

Rule 43

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

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2317

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex}\,dx = \int \left(\frac{a+b\log\left(cx^n\right)}{e} - \frac{d\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)}\right)dx$$
$$= \frac{\int \left(a+b\log\left(cx^n\right)\right)dx}{e} - \frac{d\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e}$$
$$= \frac{ax}{e} - \frac{d\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e^2} + \frac{b\int \log\left(cx^n\right)dx}{e} + \frac{(bdn)\int \frac{\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{e^2}$$
$$= \frac{ax}{e} - \frac{bnx}{e} + \frac{bx\log\left(cx^n\right)}{e} - \frac{d\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e^2} - \frac{bdn\operatorname{Li}_2\left(-\frac{ex}{d}\right)}{e^2}$$

Mathematica [A] time = 0.03, size = 66, normalized size = 0.96

$$\frac{-ad\log\left(\frac{ex}{d}+1\right) + aex + b\log\left(cx^n\right)\left(ex - d\log\left(\frac{ex}{d}+1\right)\right) - bdn\operatorname{Li}_2\left(-\frac{ex}{d}\right) - benx}{e^2}$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{bx\log\left(cx^n\right) + ax}{ex+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{\left(b\log\left(cx^n\right) + a\right)x}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.23, size = 343, normalized size = 4.97

$$\frac{i\pi bd\operatorname{csgn}(ic)\operatorname{csgn}(ix^n)\operatorname{csgn}(ic\,x^n)\ln(ex+d)}{2e^2} - \frac{i\pi bd\operatorname{csgn}(ic)\operatorname{csgn}(ic\,x^n)^2\ln(ex+d)}{2e^2} - \frac{i\pi bd\operatorname{csgn}(ix^n)\operatorname{csgn}(ic}{2e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x+d),x)
```

```
[Out] b*ln(x^n)/e*x-b*ln(x^n)*d/e^2*ln(e*x+d)-b*n*x/e-b*n*d/e^2+b*n*d/e^2*ln(e*x+
d)*ln(-1/d*e*x)+b*n*d/e^2*dilog(-1/d*e*x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)^2*d/e^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/e*x+1/2*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*d/e^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
```

```
n)*csgn(I*c)/e*x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*x+1/2*I*b*Pi*csgn
(I*c*x^n)^2*csgn(I*c)/e*x+1/2*I*b*Pi*csgn(I*c*x^n)^3*d/e^2*ln(e*x+d)-1/2*I*
b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^2*ln(e*x+d)+b*ln(c)/e*x-b*ln(c)*d/e^2*ln
(e*x+d)+a*x/e-a*d/e^2*ln(e*x+d)
```

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

$$a\left(\frac{x}{e}-\frac{d\log(ex+d)}{e^2}\right)+b\int\frac{x\log(c)+x\log(x^n)}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x),x)
```

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

sympy [A] time = 13.68, size = 144, normalized size = 2.09

$$-\frac{ad\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{e}+\frac{ax}{e}+\frac{bdn\left(\begin{cases}\frac{x}{d} \\ \frac{\begin{cases}\log(d)\log(x)-\operatorname{Li}_2\left(\frac{exe^{i\pi}}{d}\right) \\ -\log(d)\log\left(\frac{1}{x}\right)-\operatorname{Li}_2\left(\frac{exe^{i\pi}}{d}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log(d)-\operatorname{Li}_2\left(\frac{exe^{i\pi}}{d}\right.\end{cases}}{e}\end{cases}\right.}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e + a*x/e + b*d*n*P
iecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_po
lar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*p
i)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + mei
jerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)
/d), True))/e, True))/e - b*d*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, T
rue))*log(c*x**n)/e - b*n*x/e + b*x*log(c*x**n)/e
```

3.34 $\int \frac{a+b\log(cx^n)}{d+ex}\,dx$

Optimal. Leaf size=39

$$\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e}+\frac{bn\text{Li}_2\left(-\frac{ex}{d}\right)}{e}$$

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

Rubi [A] time = 0.03, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e}+\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e}$$

Antiderivative was successfully verified.

[In] Int[(a + b*Log[c*x^n])/(d + e*x),x]

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

Rule 2317

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

Rule 2391

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

Rubi steps

$$\begin{aligned}\int \frac{a+b\log\left(cx^n\right)}{d+ex}\,dx &= \frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e}-\frac{(bn)\int \frac{\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{e}\\ &= \frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e}+\frac{bn\text{Li}_2\left(-\frac{ex}{d}\right)}{e}\end{aligned}$$

Mathematica [A] time = 0.01, size = 37, normalized size = 0.95

$$\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)+bn\text{Li}_2\left(-\frac{ex}{d}\right)}{e}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*Log[c*x^n])/(d + e*x),x]

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

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{b \log(cx^n) + a}{ex + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.21, size = 195, normalized size = 5.00

$$-\frac{i\pi b \,\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)\ln(ex+d)}{2e} + \frac{i\pi b\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2\ln(ex+d)}{2e} + \frac{i\pi b\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(}{2e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x+d),x)
```

```
[Out] b*ln(e*x+d)/e*ln(x^n)-b/e*n*ln(e*x+d)*ln(-1/d*e*x)-b/e*n*dilog(-1/d*e*x)+1/
2*I*ln(e*x+d)/e*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(e*x+d)/e*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*ln(e*x+d)/e*b*Pi*csgn(I*c*x^n)^3+1/2
*I*ln(e*x+d)/e*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)+ln(e*x+d)/e*b*ln(c)+a*ln(e*x+
d)/e
```

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

$$b \int \frac{\log(c) + \log(x^n)}{ex + d}\, dx + \frac{a \log(ex + d)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{a + b\,\ln(c\,x^n)}{d + e\,x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x),x)
```

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

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

$$\int \frac{a + b \log(cx^n)}{d + ex}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.35 $\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx$

Optimal. Leaf size=44

$$\frac{bn\text{Li}_2\left(-\frac{d}{ex}\right)}{d}-\frac{\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d}$$

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

Rubi [A] time = 0.09, antiderivative size = 66, normalized size of antiderivative = 1.50, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2344, 2301, 2317, 2391}

$$-\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d}-\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2bdn}$$

Antiderivative was successfully verified.

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

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

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

Rule 2344

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

Rule 2391

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

Rubi steps

$$\begin{aligned}\int \frac{a+b\log\left(cx^n\right)}{x(d+ex)}\,dx &= \frac{\int \frac{a+b\log(cx^n)}{x}\,dx}{d}-\frac{e\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d}\\ &= \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2bdn}-\frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{d}+\frac{(bn)\int \frac{\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{d}\\ &= \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2bdn}-\frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{d}-\frac{bn\text{Li}_2\left(-\frac{ex}{d}\right)}{d}\end{aligned}$$

Mathematica [A] time = 0.03, size = 63, normalized size = 1.43

$$\frac{\left(a+b\log\left(cx^n\right)\right)\left(a+b\log\left(cx^n\right)-2bn\log\left(\frac{ex}{d}+1\right)\right)}{2bdn}-\frac{bn\mathrm{Li}_2\left(-\frac{ex}{d}\right)}{d}$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\log\left(cx^n\right)+a}{ex^2+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{b\log\left(cx^n\right)+a}{(ex+d)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.18, size = 336, normalized size = 7.64

$$-\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln(x)}{2d}+\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln\left(ex+d\right)}{2d}+\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csg}}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x+d),x)
```

```
[Out] b*ln(x^n)/d*ln(x)-b*ln(x^n)/d*ln(e*x+d)-1/2*b*n/d*ln(x)^2+b*n/d*ln(e*x+d)*l
n(-1/d*e*x)+b*n/d*dilog(-1/d*e*x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*
ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csg
n(I*c)/d*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x
^n)^2*csgn(I*c)/d*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/
d*ln(x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*ln(e*x+d)+1/2*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*ln(x)+b*ln(c)/d*ln(x)-b*ln(c)/d*ln(e*x+d)+
a/d*ln(x)-a/d*ln(e*x+d)
```

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

$$-a\left(\frac{\log\left(ex+d\right)}{d}-\frac{\log(x)}{d}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{ex^2+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{a + b\,\ln\left(c\,x^n\right)}{x\,\left(d + e\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x)),x)
```

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

sympy [C] time = 14.87, size = 158, normalized size = 3.59

$$-\frac{2ae\left(\begin{cases}\frac{1}{2e}+\frac{x}{d} & \text{for } e=0\\ -\frac{\log(-2ex)}{2e} & \text{otherwise}\end{cases}\right)}{d}-\frac{2ae\left(\begin{cases}\frac{1}{2e}+\frac{x}{d} & \text{for } e=0\\ \frac{\log(2d+2ex)}{2e} & \text{otherwise}\end{cases}\right)}{d}+bn\left(\begin{cases}-\frac{1}{ex} \\ \frac{\begin{cases}\log(e)\log(x)+\mathrm{Li}_2\left(\frac{de^{i\pi}}{ex}\right) \\ -\log(e)\log\left(\frac{1}{x}\right)+\mathrm{Li}_2\left(\frac{de^{i\pi}}{ex}\right) \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & \end{matrix}\right.\end{cases}}{}\end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2*a*e*Piecewise((1/(2*e) + x/d, Eq(e, 0)), (-log(-2*e*x)/(2*e), True))/d -
 2*a*e*Piecewise((1/(2*e) + x/d, Eq(e, 0)), (log(2*d + 2*e*x)/(2*e), True))
/d + b*n*Piecewise((-1/(e*x), Eq(d, 0)), (Piecewise((log(e)*log(x) + polylo
g(2, d*exp_polar(I*pi)/(e*x)), Abs(x) < 1), (-log(e)*log(1/x) + polylog(2,
d*exp_polar(I*pi)/(e*x)), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), (
)), x)*log(e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) + polylog(2,
d*exp_polar(I*pi)/(e*x)), True))/d, True)) - b*Piecewise((1/(e*x), Eq(d, 0)
), (log(d/x + e)/d, True))*log(c*x**n)
```

3.36 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)}\,dx$

Optimal. Leaf size=74

$$\frac{e\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}-\frac{a+b\log\left(cx^n\right)}{dx}-\frac{ben\text{Li}_2\left(-\frac{d}{ex}\right)}{d^2}-\frac{bn}{dx}$$

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

Rubi [A] time = 0.14, antiderivative size = 95, normalized size of antiderivative = 1.28, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {44, 2351, 2304, 2301, 2317, 2391}

$$\frac{ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2bd^2n}+\frac{e\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}-\frac{a+b\log\left(cx^n\right)}{dx}-\frac{bn}{dx}$$

Antiderivative was successfully verified.

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

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex)}dx = \int \left(\frac{a+b\log(cx^n)}{dx^2} - \frac{e\left(a+b\log(cx^n)\right)}{d^2x} + \frac{e^2\left(a+b\log(cx^n)\right)}{d^2(d+ex)}\right)dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^2}dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{x}dx}{d^2} + \frac{e^2\int \frac{a+b\log(cx^n)}{d+ex}dx}{d^2}$$

$$= -\frac{bn}{dx} - \frac{a+b\log(cx^n)}{dx} - \frac{e\left(a+b\log(cx^n)\right)^2}{2bd^2n} + \frac{e\left(a+b\log(cx^n)\right)\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{(ben)\int \cdots}{\cdots}$$

$$= -\frac{bn}{dx} - \frac{a+b\log(cx^n)}{dx} - \frac{e\left(a+b\log(cx^n)\right)^2}{2bd^2n} + \frac{e\left(a+b\log(cx^n)\right)\log\left(1+\frac{ex}{d}\right)}{d^2} + \frac{ben\mathrm{Li}_2\left(\cdots\right)}{d^2}$$

Mathematica [A] time = 0.09, size = 88, normalized size = 1.19

$$-\frac{-2e\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right) + \frac{2d\left(a+b\log(cx^n)\right)}{x} + \frac{e\left(a+b\log(cx^n)\right)^2}{bn} - 2ben\mathrm{Li}_2\left(-\frac{ex}{d}\right) + \frac{2bdn}{x}}{2d^2}$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\log(cx^n)+a}{ex^3+dx^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{b\log(cx^n)+a}{(ex+d)x^2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.19, size = 504, normalized size = 6.81

$$-\frac{ben\,\mathrm{dilog}\left(-\frac{ex}{d}\right)}{d^2} + \frac{be\ln(x^n)\ln(ex+d)}{d^2} - \frac{be\ln(x)\ln(x^n)}{d^2} + \frac{ben\ln(x)^2}{2d^2} - \frac{be\ln(c)\ln(x)}{d^2} + \frac{be\ln(c)\ln(ex+d)}{d^2} + \frac{i\pi bcsg\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*ln(x^n)*e/d^2*ln(e*x+d)-b*ln(x^n)*e/d^2*ln(x)-b*n*e/d^2*dilog(-1/d*e*x)+1
/2*b*n*e/d^2*ln(x)^2-b*ln(c)*e/d^2*ln(x)+b*ln(c)*e/d^2*ln(e*x+d)+1/2*I*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csg
n(I*c)*e/d^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2*ln(x)+1/2
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/x-1/2*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)^2*e/d^2*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d/x+1/2*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2*ln(x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*e/d^2*ln(e*x+d)-b*n*e/d^2*ln(e*x+d)*ln(-1/d*e*x)-a/d/x-b*ln(x^n)
/d/x-a*e/d^2*ln(x)+a*e/d^2*ln(e*x+d)-b*ln(c)/d/x-b*n/d/x-1/2*I*b*Pi*csgn(I*
c*x^n)^3*e/d^2*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^3*e/d^2*ln(x)-1/2*I*b*Pi*
csgn(I*x^n)*csgn(I*c*x^n)^2/d/x-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x
```

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

$$a\left(\frac{e\log\left(ex+d\right)}{d^2}-\frac{e\log(x)}{d^2}-\frac{1}{dx}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{ex^3+dx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 61.19, size = 197, normalized size = 2.66

$$-\frac{a}{dx}+\frac{ae^2\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{d^2}-\frac{ae\log(x)}{d^2}-\frac{bn}{dx}-\frac{b\log(cx^n)}{dx}-\frac{be^2n\left(\begin{cases}\frac{x}{d}\\ \begin{cases}\log(d)\log(x)-\operatorname{Li}_2\left(\frac{exe^{i\pi}}{d}\right)\\ -\log(d)\log\left(\frac{1}{x}\right)-\operatorname{Li}_2\left(\frac{exe^{i\pi}}{d}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(d)+G_{2,2}^{0,2}\left(\cdots\right.\end{cases}\end{cases}\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a/(d*x) + a*e**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d**2 -
 a*e*log(x)/d**2 - b*n/(d*x) - b*log(c*x**n)/(d*x) - b*e**2*n*Piecewise((x/
d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(I*pi)/d)
, Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs
(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1)
, ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d), True))/
e, True))/d**2 + b*e**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))*
log(c*x**n)/d**2 + b*e*n*log(x)**2/(2*d**2) - b*e*log(x)*log(c*x**n)/d**2
```

3.37 $\int \frac{a+b\log(cx^n)}{x^3(d+ex)}\,dx$

Optimal. Leaf size=110

$$-\frac{e^2\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{e\left(a+b\log\left(cx^n\right)\right)}{d^2x}-\frac{a+b\log\left(cx^n\right)}{2dx^2}+\frac{be^2n\text{Li}_2\left(-\frac{d}{ex}\right)}{d^3}+\frac{ben}{d^2x}-\frac{bn}{4dx^2}$$

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

Rubi [A] time = 0.17, antiderivative size = 135, normalized size of antiderivative = 1.23, number of steps used = 7, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {44, 2351, 2304, 2301, 2317, 2391}

$$-\frac{be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{2bd^3n}-\frac{e^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{e\left(a+b\log\left(cx^n\right)\right)}{d^2x}-\frac{a+b\log\left(cx^n\right)}{2dx^2}$$

Antiderivative was successfully verified.

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

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex)}\,dx = \int \left(\frac{a+b\log(cx^n)}{dx^3} - \frac{e\left(a+b\log(cx^n)\right)}{d^2x^2} + \frac{e^2\left(a+b\log(cx^n)\right)}{d^3x} - \frac{e^3\left(a+b\log(cx^n)\right)}{d^3(d+ex)}\right)$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^2} + \frac{e^2\int \frac{a+b\log(cx^n)}{x}\,dx}{d^3} - \frac{e^3\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^3}$$

$$= -\frac{bn}{4dx^2} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{2dx^2} + \frac{e\left(a+b\log(cx^n)\right)}{d^2x} + \frac{e^2\left(a+b\log(cx^n)\right)^2}{2bd^3n} - \frac{e^2\left(a+\right.}{}$$

$$= -\frac{bn}{4dx^2} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{2dx^2} + \frac{e\left(a+b\log(cx^n)\right)}{d^2x} + \frac{e^2\left(a+b\log(cx^n)\right)^2}{2bd^3n} - \frac{e^2\left(a+\right.}{}$$

Mathematica [A] time = 0.21, size = 124, normalized size = 1.13

$$-\frac{\frac{2d^2\left(a+b\log(cx^n)\right)}{x^2} + 4e^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right) - \frac{4de\left(a+b\log(cx^n)\right)}{x} - \frac{2e^2\left(a+b\log(cx^n)\right)^2}{bn} + \frac{bd^2n}{x^2} + 4be^2n\mathrm{Li}_2\left(-\frac{ex}{d}\right)}{4d^3}$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{ex^4+dx^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e*x^4 + d*x^3), x)
```

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

$$\int \frac{b\log(cx^n)+a}{(ex+d)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.19, size = 689, normalized size = 6.26

$$\frac{b\,e^2n\,\mathrm{dilog}\left(-\frac{ex}{d}\right)}{d^3} + \frac{be\ln(x^n)}{d^2x} - \frac{b\,e^2\ln(x^n)\ln(ex+d)}{d^3} + \frac{b\,e^2\ln(x)\ln(x^n)}{d^3} + \frac{be\ln(c)}{d^2x} - \frac{b\,e^2\ln(c)\ln(ex+d)}{d^3} + \frac{b\,e^2\ln}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*ln(x^n)*e/d^2/x-b*ln(x^n)*e^2/d^3*ln(e*x+d)+b*ln(x^n)*e^2/d^3*ln(x)+b*ln(
c)*e/d^2/x-b*ln(c)*e^2/d^3*ln(e*x+d)+b*ln(c)*e^2/d^3*ln(x)-1/2*b*n*e^2/d^3*
ln(x)^2+b*n*e^2/d^3*dilog(-1/d*e*x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*
e/d^2/x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3*ln(e*x+d)-1/
2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3*ln(x)-1/2*I*b*Pi*csgn(
I*c*x^n)^2*csgn(I*c)*e^2/d^3*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
*e/d^2/x+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/x^2-1/2*b*ln(x^n)
/d/x^2+1/4*I*b*Pi*csgn(I*c*x^n)^3/d/x^2+b*n*e^2/d^3*ln(e*x+d)*ln(-1/d*e*x)+
1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3*ln(x)+a*e^2/d^3*ln(x)+a*e/d^
2/x-a*e^2/d^3*ln(e*x+d)-1/2*b*ln(c)/d/x^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I
*c)*e^2/d^3*ln(x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3*ln(e*x+d)-
1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/x-1/2*a/d/x^2-1/4*b*n/
d/x^2-1/2*I*b*Pi*csgn(I*c*x^n)^3*e/d^2/x+1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3
*ln(e*x+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x^2-1/4*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)^2/d/x^2-1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3*ln(x)+b*e*n/d^2/
x
```

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

$$-\frac{1}{2}\,a\left(\frac{2\,e^2\log\left(ex+d\right)}{d^3}-\frac{2\,e^2\log(x)}{d^3}-\frac{2\,ex-d}{d^2x^2}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{ex^4+dx^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,\left(d+e\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 77.20, size = 246, normalized size = 2.24

$$-\frac{a}{2dx^2}+\frac{ae}{d^2x}-\frac{ae^3\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{d^3}+\frac{ae^2\log(x)}{d^3}-\frac{bn}{4dx^2}-\frac{b\log(cx^n)}{2dx^2}+\frac{ben}{d^2x}+\frac{be\log(cx^n)}{d^2x}+\frac{be^3n\left(\left(\begin{cases}\frac{x}{d} & \\ \log(d) \ldots & \\ -\log(\ldots & \\ -G_{2,2}^{2,0}\left(\ldots\right. & \end{cases}\right.\right.}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a/(2*d*x**2) + a*e/(d**2*x) - a*e**3*Piecewise((x/d, Eq(e, 0)), (log(d + e
*x)/e, True))/d**3 + a*e**2*log(x)/d**3 - b*n/(4*d*x**2) - b*log(c*x**n)/(2
*d*x**2) + b*e*n/(d**2*x) + b*e*log(c*x**n)/(d**2*x) + b*e**3*n*Piecewise((
x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(I*pi)/
d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d), 1/A
bs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1,
1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d), True)
)/e, True))/d**3 - b*e**3*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True)
)*log(c*x**n)/d**3 - b*e**2*n*log(x)**2/(2*d**3) + b*e**2*log(x)*log(c*x**n
)/d**3
```

3.38 $\int \frac{a+b\log(cx^n)}{x^4(d+ex)}\,dx$

Optimal. Leaf size=150

$$\frac{e^3\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{d^3x}+\frac{e\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2}-\frac{a+b\log\left(cx^n\right)}{3dx^3}-\frac{be^3n\text{Li}_2\left(-\frac{d}{ex}\right)}{d^4}-\frac{be^2n}{d^3x}+$$

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

Rubi [A] time = 0.21, antiderivative size = 173, normalized size of antiderivative = 1.15, number of steps used = 8, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {44, 2351, 2304, 2301, 2317, 2391}

$$\frac{be^3n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}-\frac{e^3\left(a+b\log\left(cx^n\right)\right)^2}{2bd^4n}+\frac{e^3\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{d^3x}+\frac{e\left(a+b\log\left(\right.\right.}{2d^2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*(d + e*x)),x]
```

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
```

```
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4(d+ex)}\,dx = \int \left(\frac{a+b\log(cx^n)}{dx^4} - \frac{e\left(a+b\log(cx^n)\right)}{d^2x^3} + \frac{e^2\left(a+b\log(cx^n)\right)}{d^3x^2} - \frac{e^3\left(a+b\log(cx^n)\right)}{d^4x} + \right.$$
$$= \frac{\int \frac{a+b\log(cx^n)}{x^4}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d^2} + \frac{e^2\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^3} - \frac{e^3\int \frac{a+b\log(cx^n)}{x}\,dx}{d^4} + \frac{e^4\int \frac{a+}{}}{}$$
$$= -\frac{bn}{9dx^3} + \frac{ben}{4d^2x^2} - \frac{be^2n}{d^3x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e\left(a+b\log(cx^n)\right)}{2d^2x^2} - \frac{e^2\left(a+b\log(cx^n)\right)}{d^3x} -$$
$$= -\frac{bn}{9dx^3} + \frac{ben}{4d^2x^2} - \frac{be^2n}{d^3x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e\left(a+b\log(cx^n)\right)}{2d^2x^2} - \frac{e^2\left(a+b\log(cx^n)\right)}{d^3x} -$$

Mathematica [A] time = 0.21, size = 159, normalized size = 1.06

$$\frac{-\frac{12d^3\left(a+b\log(cx^n)\right)}{x^3} + \frac{18d^2e\left(a+b\log(cx^n)\right)}{x^2} + 36e^3\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right) - \frac{36de^2\left(a+b\log(cx^n)\right)}{x} - \frac{18e^3\left(a+b\log(cx^n)\right)^2}{bn} -}{36d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*(d + e*x)),x]
```

```
[Out] ((-4*b*d^3*n)/x^3 + (9*b*d^2*e*n)/x^2 - (36*b*d*e^2*n)/x - (12*d^3*(a + b*L
og[c*x^n]))/x^3 + (18*d^2*e*(a + b*Log[c*x^n]))/x^2 - (36*d*e^2*(a + b*Log[
c*x^n]))/x - (18*e^3*(a + b*Log[c*x^n])^2)/(b*n) + 36*e^3*(a + b*Log[c*x^n]
)*Log[1 + (e*x)/d] + 36*b*e^3*n*PolyLog[2, -((e*x)/d)])/(36*d^4)
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{ex^5+dx^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^5 + d*x^4), x)
```

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

$$\int \frac{b\log(cx^n)+a}{(ex+d)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)*x^4), x)
```

maple [C] time = 0.20, size = 868, normalized size = 5.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^4/(e*x+d),x)
```

```
[Out] 1/2*b*ln(x^n)*e/d^2/x^2-b*ln(x^n)*e^3/d^4*ln(x)+b*ln(x^n)*e^3/d^4*ln(e*x+d)
-b*ln(x^n)*e^2/d^3/x+1/2*b*n*e^3/d^4*ln(x)^2-b*n*e^3/d^4*dilog(-1/d*e*x)-b*
ln(c)*e^2/d^3/x+1/2*b*ln(c)*e/d^2/x^2-b*ln(c)*e^3/d^4*ln(x)+b*ln(c)*e^3/d^4
*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^3/d^4*ln(e*x+d)+1/2*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^3/d^4*ln(x)-1/4*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/x^2+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)/d/x^3-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^3/d^4*ln(x)-1/2*I*b*
Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^3/d^4*ln(x)-a*e^3/d^4*ln(x)+a*e^3/d^4*ln(e*x
+d)-a*e^2/d^3/x+1/2*a*e/d^2/x^2-1/3*b*ln(c)/d/x^3+1/4*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)^2*e/d^2/x^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^3/d^4*ln(e*x
+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3/x-1/3*b*ln(x^n)/d/x^3-b*n*
e^3/d^4*ln(e*x+d)*ln(-1/d*e*x)+1/6*I*b*Pi*csgn(I*c*x^n)^3/d/x^3-1/3*a/d/x^3
-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3/x+1/4*I*b*Pi*csgn(I*c*x^n)^
2*csgn(I*c)*e/d^2/x^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^
3/x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^3/d^4*ln(e*x+d)-1/9*b*
n/d/x^3-1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x^3-1/4*I*b*Pi*csgn(I*c*x^n)
^3*e/d^2/x^2+1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3/x-1/6*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)^2/d/x^3+1/2*I*b*Pi*csgn(I*c*x^n)^3*e^3/d^4*ln(x)-1/2*I*b*Pi*csg
n(I*c*x^n)^3*e^3/d^4*ln(e*x+d)+1/4*b*e*n/d^2/x^2-b*e^2*n/d^3/x
```

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

$$\frac{1}{6}\,a\left(\frac{6\,e^3\log\left(ex+d\right)}{d^4}-\frac{6\,e^3\log(x)}{d^4}-\frac{6\,e^2x^2-3\,dex+2\,d^2}{d^3x^3}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{ex^5+dx^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x+d),x, algorithm="maxima")
```

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^n\right)}{x^4\,\left(d+e\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^4*(d + e*x)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^4*(d + e*x)), x)
```

sympy [A] time = 91.86, size = 296, normalized size = 1.97

$$-\frac{a}{3dx^3}+\frac{ae}{2d^2x^2}-\frac{ae^2}{d^3x}+\frac{ae^4\left(\begin{cases}\frac{x}{d} & \text{for}\ e=0\\ \frac{\log\left(d+ex\right)}{e} & \text{otherwise}\end{cases}\right)}{d^4}-\frac{ae^3\log\left(x\right)}{d^4}-\frac{bn}{9dx^3}-\frac{b\log\left(cx^n\right)}{3dx^3}+\frac{ben}{4d^2x^2}+\frac{be\log\left(cx^n\right)}{2d^2x^2}-\frac{be^2n}{d^3x}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x+d),x)
```

```
[Out] -a/(3*d*x**3) + a*e/(2*d**2*x**2) - a*e**2/(d**3*x) + a*e**4*Piecewise((x/d
, Eq(e, 0)), (log(d + e*x)/e, True))/d**4 - a*e**3*log(x)/d**4 - b*n/(9*d*x
**3) - b*log(c*x**n)/(3*d*x**3) + b*e*n/(4*d**2*x**2) + b*e*log(c*x**n)/(2*
d**2*x**2) - b*e**2*n/(d**3*x) - b*e**2*log(c*x**n)/(d**3*x) - b*e**4*n*Pie
cewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_pola
r(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)
/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meije
rg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d
), True))/e, True))/d**4 + b*e**4*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/
e, True))*log(c*x**n)/d**4 + b*e**3*n*log(x)**2/(2*d**4) - b*e**3*log(x)*lo
g(c*x**n)/d**4
```

3.39 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex)^2}\,dx$

Optimal. Leaf size=152

$$\frac{d^2\log\left(\frac{ex}{d}+1\right)\left(3a+3b\log\left(cx^n\right)+bn\right)}{e^4}-\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)}+\frac{x^2\left(3a+3b\log\left(cx^n\right)+bn\right)}{2e^2}-\frac{dx(3a+bn)}{e^3}-\frac{3bdx\log}{e}$$

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

Rubi [A] time = 0.18, antiderivative size = 151, normalized size of antiderivative = 0.99, number of steps used = 9, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {43, 2351, 2295, 2304, 2314, 31, 2317, 2391}

$$\frac{3bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}-\frac{d^2x\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)}+\frac{3d^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}-\frac{2adx}{e^3}-\frac{2b}{}$$

Antiderivative was successfully verified.

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

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

Rule 31

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

Rule 43

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

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2}\,dx = \int\left(-\frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)^2}+\frac{3d^2\left(a+b\right.}{e^3(d\right.}$$

$$= -\frac{(2d)\int\left(a+b\log\left(cx^n\right)\right)dx}{e^3}+\frac{\left(3d^2\right)\int\frac{a+b\log(cx^n)}{d+ex}\,dx}{e^3}-\frac{d^3\int\frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^3}+\frac{\int x\left(\right.}{}$$

$$= -\frac{2adx}{e^3}-\frac{bnx^2}{4e^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}-\frac{d^2x\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)}+\frac{3d^2\left(a+b\log\left(cx\right.\right.}{e^4}$$

$$= -\frac{2adx}{e^3}+\frac{2bdnx}{e^3}-\frac{bnx^2}{4e^2}-\frac{2bdx\log\left(cx^n\right)}{e^3}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}-\frac{d^2x\left(a+b\log\right.}{e^3(d+ex}$$

Mathematica [A] time = 0.14, size = 141, normalized size = 0.93

$$\frac{\frac{4d^3\left(a+b\log\left(cx^n\right)\right)}{d+ex}+12d^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)+2e^2x^2\left(a+b\log\left(cx^n\right)\right)-8adex-8bdex\log\left(cx^n\right)+12bd}{4e^4}$$

Antiderivative was successfully verified.

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

```
[Out] (-8*a*d*e*x + 8*b*d*e*n*x - b*e^2*n*x^2 - 8*b*d*e*x*Log[c*x^n] + 2*e^2*x^2*
(a + b*Log[c*x^n]) + (4*d^3*(a + b*Log[c*x^n]))/(d + e*x) - 4*b*d^2*n*(Log[
x] - Log[d + e*x]) + 12*d^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] + 12*b*d^2*
n*PolyLog[2, -((e*x)/d)])/(4*e^4)
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{\left(b \log \left(c x^{n}\right)+a\right) x^{3}}{(e x+d)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.21, size = 739, normalized size = 4.86

$$-\frac{i\pi b\, d^{3} \operatorname{csgn}(ic) \operatorname{csgn}(ix^{n}) \operatorname{csgn}(ic\,x^{n})}{2\,(ex+d)\, e^{4}}-\frac{3 i\pi b\, d^{2} \operatorname{csgn}(ic) \operatorname{csgn}(ix^{n}) \operatorname{csgn}(ic\,x^{n}) \ln(ex+d)}{2 e^{4}}+\frac{i\pi b d x \operatorname{csgn}(ic) \operatorname{csg}}{e^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -3*b*n/e^4*d^2*dilog(-1/d*e*x)-b*n/e^4*d^2*ln(e*x)+b*n/e^4*d^2*ln(e*x+d)-2*
b*ln(c)/e^3*x*d+b*ln(c)*d^3/e^4/(e*x+d)+3*b*ln(c)/e^4*d^2*ln(e*x+d)+b*ln(x^
n)*d^3/e^4/(e*x+d)+3*b*ln(x^n)/e^4*d^2*ln(e*x+d)-2*b*ln(x^n)/e^3*x*d+I*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^3*x*d-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*d^3/e^4/(e*x+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)/e^2*x^2+3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^4*d^2*ln(e*x+d)+1/2*b*l
n(x^n)/e^2*x^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^3/e^4/(e*x+d)-2*a/e^3
*x*d+a*d^3/e^4/(e*x+d)+3*a/e^4*d^2*ln(e*x+d)+1/2*b*ln(c)/e^2*x^2+9/4*b*n/e^
4*d^2-1/4*I*b*Pi*csgn(I*c*x^n)^3/e^2*x^2+1/2*a/e^2*x^2+1/2*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)^2*d^3/e^4/(e*x+d)-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^3*x
*d-3*b*n/e^4*d^2*ln(e*x+d)*ln(-1/d*e*x)+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n
)^2/e^4*d^2*ln(e*x+d)-I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^3*x*d-3/2*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^4*d^2*ln(e*x+d)-1/4*b*n*x^2/e^2-3/2*I*
b*Pi*csgn(I*c*x^n)^3/e^4*d^2*ln(e*x+d)+I*b*Pi*csgn(I*c*x^n)^3/e^3*x*d+1/4*I
*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*x^2-1/2*I*b*Pi*csgn(I*c*x^n)^3*d^3/e^4/
(e*x+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*x^2+2*b*d*n*x/e^3
```

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

$$\frac{1}{2}\left(\frac{2\,d^{3}}{e^{5} x+d e^{4}}+\frac{6\,d^{2} \log(ex+d)}{e^{4}}+\frac{e x^{2}-4\,d x}{e^{3}}\right) a+b \int \frac{x^{3} \log(c)+x^{3} \log\left(x^{n}\right)}{e^{2} x^{2}+2\,d e x+d^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^{3}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{\left(d+e\,x\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 58.73, size = 304, normalized size = 2.00

$$-\frac{ad^3\left(\begin{cases}\frac{x}{d^2} & \text{for } e=0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{e^3}+\frac{3ad^2\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{e^3}-\frac{2adx}{e^3}+\frac{ax^2}{2e^2}+\frac{bd^3n\left(\begin{cases}\frac{x}{d^2} & \text{for } \\ -\frac{\log(x)}{de}+\frac{\log\left(\frac{d}{e}+x\right)}{de} & \text{oth}\end{cases}\right)}{e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d**3*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**3 + 3*a
*d**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**3 - 2*a*d*x/e**
3 + a*x**2/(2*e**2) + b*d**3*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e)
 + log(d/e + x)/(d*e), True))/e**3 - b*d**3*Piecewise((x/d**2, Eq(e, 0)), (
-1/(d*e + e**2*x), True))*log(c*x**n)/e**3 - 3*b*d**2*n*Piecewise((x/d, Eq(
e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(
x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) <
1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1), ()),
 ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d), True))/e, Tru
e))/e**3 + 3*b*d**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))*log(
c*x**n)/e**3 + 2*b*d*n*x/e**3 - 2*b*d*x*log(c*x**n)/e**3 - b*n*x**2/(4*e**2
) + b*x**2*log(c*x**n)/(2*e**2)
```

3.40 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex)^2}\,dx$

Optimal. Leaf size=98

$$-\frac{d\log\left(\frac{ex}{d}+1\right)\left(2a+2b\log\left(cx^n\right)+bn\right)}{e^3}-\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)}+\frac{2x\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{2bdn\text{Li}_2\left(-\frac{ex}{d}\right)}{e^3}-\frac{bnx}{e^2}$$

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

Rubi [A] time = 0.14, antiderivative size = 106, normalized size of antiderivative = 1.08, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {43, 2351, 2295, 2314, 31, 2317, 2391}

$$-\frac{2bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)}-\frac{2d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{ax}{e^2}+\frac{bx\log\left(cx^n\right)}{e^2}-\frac{bdn\log(d+ex)}{e^3}$$

Antiderivative was successfully verified.

[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x)^2,x]

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

Rule 31

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

Rule 43

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

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\begin{aligned}\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2}\,dx &= \int\left(\frac{a+b\log\left(cx^n\right)}{e^2}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)^2}-\frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)}\right)dx\\ &= \frac{\int\left(a+b\log\left(cx^n\right)\right)dx}{e^2}-\frac{(2d)\int\frac{a+b\log(cx^n)}{d+ex}\,dx}{e^2}+\frac{d^2\int\frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^2}\\ &= \frac{ax}{e^2}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)}-\frac{2d\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e^3}+\frac{b\int\log\left(cx^n\right)dx}{e^2}+\\ &= \frac{ax}{e^2}-\frac{bnx}{e^2}+\frac{bx\log\left(cx^n\right)}{e^2}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)}-\frac{bdn\log(d+ex)}{e^3}-\frac{2d\left(a+b\log\right.}{}\end{aligned}$$

Mathematica [A] time = 0.09, size = 98, normalized size = 1.00

$$\frac{-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{d+ex}-2d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)+aex+bex\log\left(cx^n\right)-2bdn\text{Li}_2\left(-\frac{ex}{d}\right)+bdn(\log(x)-\log(d}{e^3}$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\log\left(cx^n\right)+ax^2}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x^2}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.20, size = 558, normalized size = 5.69

$$-\frac{b\,d^{2}\ln\left(x^{n}\right)}{\left(ex+d\right)e^{3}}-\frac{2bd\ln\left(x^{n}\right)\ln\left(ex+d\right)}{e^{3}}-\frac{2bd\ln(c)\ln\left(ex+d\right)}{e^{3}}-\frac{b\,d^{2}\ln(c)}{\left(ex+d\right)e^{3}}-\frac{bdn\ln\left(ex+d\right)}{e^{3}}+\frac{bdn\ln\left(ex\right)}{e^{3}}+\frac{2bdn\,\mathrm{dilog}}{e^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*ln(x^n)*d^2/e^3/(e*x+d)-2*b*ln(x^n)/e^3*d*ln(e*x+d)-2*b*ln(c)/e^3*d*ln(e
*x+d)-b*ln(c)*d^2/e^3/(e*x+d)-b*n/e^3*d*ln(e*x+d)+b*n/e^3*d*ln(e*x)+2*b*n/e
^3*d*dilog(-1/d*e*x)-I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^3*d*ln(e*x+d)+1/2*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^3/(e*x+d)+I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)/e^3*d*ln(e*x+d)-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^
2/e^3*d*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^2*x+b*ln(x^n)/e^2*x+2*b*n/e^
3*d*ln(e*x+d)*ln(-1/d*e*x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e
^2*x-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^3/(e*x+d)-b*n/e^3*d-a*d^2/e
^3/(e*x+d)-2*a/e^3*d*ln(e*x+d)+b*ln(c)/e^2*x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)^2*d^2/e^3/(e*x+d)-b*n*x/e^2+a*x/e^2+I*b*Pi*csgn(I*c*x^n)^3/e^3*d*ln(
e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*x+1/2*I*b*Pi*csgn(I*c*x^n
)^3*d^2/e^3/(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*x
```

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

$$-a\left(\frac{d^{2}}{e^{4}x+de^{3}}-\frac{x}{e^{2}}+\frac{2\,d\log\left(ex+d\right)}{e^{3}}\right)+b\int\frac{x^{2}\log(c)+x^{2}\log\left(x^{n}\right)}{e^{2}x^{2}+2\,dex+d^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*(d^2/(e^4*x + d*e^3) - x/e^2 + 2*d*log(e*x + d)/e^3) + b*integrate((x^2*
log(c) + x^2*log(x^n))/(e^2*x^2 + 2*d*e*x + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 30.05, size = 250, normalized size = 2.55

$$\frac{ad^{2}\left(\begin{cases}\frac{x}{d^{2}} & \text{for}\ e=0\\-\frac{1}{de+e^{2}x} & \text{otherwise}\end{cases}\right)}{e^{2}}-\frac{2ad\left(\begin{cases}\frac{x}{d} & \text{for}\ e=0\\\frac{\log\left(d+ex\right)}{e} & \text{otherwise}\end{cases}\right)}{e^{2}}+\frac{ax}{e^{2}}-\frac{bd^{2}n\left(\begin{cases}\frac{x}{d^{2}} & \text{for}\ e=0\\-\frac{\log\left(x\right)}{de}+\frac{\log\left(\frac{d}{e}+x\right)}{de} & \text{otherwise}\end{cases}\right)}{e^{2}}+\frac{bd^{2}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**2 - 2*a*
d*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**2 + a*x/e**2 - b*d*
*2*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) + log(d/e + x)/(d*e), Tru
e))/e**2 + b*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))*
log(c*x**n)/e**2 + 2*b*d*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*lo
g(x) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) -
polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), (
(0, 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - po
lylog(2, e*x*exp_polar(I*pi)/d), True))/e, True))/e**2 - 2*b*d*Piecewise((x
/d, Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/e**2 - b*n*x/e**2 + b*x*
log(c*x**n)/e**2
```

3.41 $\int \frac{x(a+b\log(cx^n))}{(d+ex)^2}\,dx$

Optimal. Leaf size=65

$$\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)+bn\right)}{e^2}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)}+\frac{bn\text{Li}_2\left(-\frac{ex}{d}\right)}{e^2}$$

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

Rubi [A] time = 0.11, antiderivative size = 74, normalized size of antiderivative = 1.14, number of steps used = 6, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {43, 2351, 2314, 31, 2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^2}+\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)}+\frac{bn\log(d+ex)}{e^2}$$

Antiderivative was successfully verified.

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

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

Rule 31

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

Rule 43

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

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2}\,dx=\int\left(-\frac{d\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)^2}+\frac{a+b\log\left(cx^n\right)}{e(d+ex)}\right)dx$$
$$=\frac{\int\frac{a+b\log(cx^n)}{d+ex}\,dx}{e}-\frac{d\int\frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e}$$
$$=-\frac{x\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)}+\frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e^2}-\frac{(bn)\int\frac{\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{e^2}+\frac{(bn)\int}{}$$
$$=-\frac{x\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)}+\frac{bn\log(d+ex)}{e^2}+\frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e^2}+\frac{bn\mathrm{Li}_2\left(-\frac{e}{}\right.}{e^2}$$

Mathematica [A] time = 0.06, size = 71, normalized size = 1.09

$$\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)+\frac{d\left(a+b\log\left(cx^n\right)\right)}{d+ex}+bn\mathrm{Li}_2\left(-\frac{ex}{d}\right)-bn(\log(x)-\log(d+ex))}{e^2}$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bx\log\left(cx^n\right)+ax}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.18, size = 389, normalized size = 5.98

$$-\frac{i\pi bd\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{2\left(ex+d\right)e^2}+\frac{i\pi bd\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{2\left(ex+d\right)e^2}+\frac{i\pi bd\,\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{2\left(ex+d\right)e^2}-\frac{i\pi bd\mathrm{csgn}}{2\,(ex+}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*ln(x^n)*d/e^2/(e*x+d)+b*ln(x^n)/e^2*ln(e*x+d)-b*n/e^2*ln(e*x+d)*ln(-1/d*e
*x)-b*n/e^2*dilog(-1/d*e*x)-b*n/e^2*ln(e*x)+b*n/e^2*ln(e*x+d)-1/2*I*b*Pi*cs
gn(I*c*x^n)^3*d/e^2/(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^2/(e
*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2/(e*x+d)-1/2*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)^2/e^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^2*ln(e*x+d)+1/2
*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*
csgn(I*c)*d/e^2/(e*x+d)+b*ln(c)*d/e^2/(e*x+d)+b*ln(c)/e^2*ln(e*x+d)+a*d/e^2
/(e*x+d)+a/e^2*ln(e*x+d)
```

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

$$a\left(\frac{d}{e^3x + de^2} + \frac{\log(ex + d)}{e^2}\right) + b\int \frac{x\log(c) + x\log(x^n)}{e^2x^2 + 2\,dex + d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{x\left(a + b\log\left(cx^n\right)\right)}{\left(d + ex\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.42 $\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx$

Optimal. Leaf size=39

$$\frac{x\left(a+b\log\left(cx^n\right)\right)}{d(d+ex)}-\frac{bn\log(d+ex)}{de}$$

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

Rubi [A] time = 0.02, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2314, 31}

$$\frac{x\left(a+b\log\left(cx^n\right)\right)}{d(d+ex)}-\frac{bn\log(d+ex)}{de}$$

Antiderivative was successfully verified.

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

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

Rule 31

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

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x] && EqQ[r*(q + 1) + 1, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log\left(cx^n\right)}{(d+ex)^2}\,dx &= \frac{x\left(a+b\log\left(cx^n\right)\right)}{d(d+ex)}-\frac{(bn)\int \frac{1}{d+ex}\,dx}{d}\\ &= \frac{x\left(a+b\log\left(cx^n\right)\right)}{d(d+ex)}-\frac{bn\log(d+ex)}{de}\end{aligned}$$

Mathematica [A] time = 0.03, size = 41, normalized size = 1.05

$$\frac{\frac{bn(\log(x)-\log(d+ex))}{d}-\frac{a+b\log(cx^n)}{d+ex}}{e}$$

Antiderivative was successfully verified.

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

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

fricas [A] time = 0.47, size = 51, normalized size = 1.31

$$\frac{benx\log(x)-bd\log(c)-ad-(benx+bdn)\log(ex+d)}{de^2x+d^2e}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [A] time = 0.29, size = 58, normalized size = 1.49

$$-\frac{bnxe\log\left(xe+d\right)-bnxe\log(x)+bdn\log\left(xe+d\right)+bd\log(c)+ad}{dxe^{2}+d^{2}e}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.20, size = 173, normalized size = 4.44

$$-\frac{b\ln\left(x^{n}\right)}{\left(ex+d\right)e}-\frac{-i\pi bd\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)+i\pi bd\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^{n}\right)^{2}+i\pi bd\,\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)^{2}\cdots}{2\,(\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b/e/(e*x+d)*ln(x^n)-1/2*(I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*csg
n(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-I*Pi*b*d*csgn(I*c*x^n)^3+I*Pi*b*d*csgn(I*c
)*csgn(I*c*x^n)^2+2*ln(e*x+d)*b*e*n*x-2*ln(-x)*b*e*n*x+2*ln(e*x+d)*b*d*n-2*
ln(-x)*b*d*n+2*b*d*ln(c)+2*a*d)/(e*x+d)/e/d
```

maxima [A] time = 0.54, size = 63, normalized size = 1.62

$$-bn\left(\frac{\log\left(ex+d\right)}{de}-\frac{\log(x)}{de}\right)-\frac{b\log\left(cx^{n}\right)}{e^{2}x+de}-\frac{a}{e^{2}x+de}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 4.56, size = 54, normalized size = 1.38

$$-\frac{a}{x\,e^{2}+d\,e}-\frac{b\,\ln\left(c\,x^{n}\right)}{e\,\left(d+e\,x\right)}-\frac{2\,b\,n\,\mathrm{atanh}\left(\frac{2\,e\,x}{d}+1\right)}{d\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 2.35, size = 187, normalized size = 4.79

$$\begin{cases} \tilde{\infty}\left(-\frac{a}{x}-\frac{bn\log(x)}{x}-\frac{bn}{x}-\frac{b\log(c)}{x}\right) & \text{for } d=0\wedge e=0\\ \frac{ax+bnx\log(x)-bnx+bx\log(c)}{d^2} & \text{for } e=0\\ \frac{-\frac{a}{x}-\frac{bn\log(x)}{x}-\frac{bn}{x}-\frac{b\log(c)}{x}}{e^2} & \text{for } d=0\\ -\frac{ad}{d^2e+de^2x}-\frac{bdn\log\left(\frac{d}{e}+x\right)}{d^2e+de^2x}+\frac{benx\log(x)}{d^2e+de^2x}-\frac{benx\log\left(\frac{d}{e}+x\right)}{d^2e+de^2x}+\frac{bex\log(c)}{d^2e+de^2x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((zoo*(-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x), Eq(d, 0) & Eq(e,
 0)), ((a*x + b*n*x*log(x) - b*n*x + b*x*log(c))/d**2, Eq(e, 0)), ((-a/x -
b*n*log(x)/x - b*n/x - b*log(c)/x)/e**2, Eq(d, 0)), (-a*d/(d**2*e + d*e**2*
x) - b*d*n*log(d/e + x)/(d**2*e + d*e**2*x) + b*e*n*x*log(x)/(d**2*e + d*e*
*2*x) - b*e*n*x*log(d/e + x)/(d**2*e + d*e**2*x) + b*e*x*log(c)/(d**2*e + d
*e**2*x), True))
```

3.43 $\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx$

Optimal. Leaf size=80

$$-\frac{\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}-\frac{ex\left(a+b\log\left(cx^n\right)\right)}{d^2(d+ex)}+\frac{bn\text{Li}_2\left(-\frac{d}{ex}\right)}{d^2}+\frac{bn\log(d+ex)}{d^2}$$

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

Rubi [A] time = 0.16, antiderivative size = 102, normalized size of antiderivative = 1.28, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2347, 2344, 2301, 2317, 2391, 2314, 31}

$$-\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2}-\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}-\frac{ex\left(a+b\log\left(cx^n\right)\right)}{d^2(d+ex)}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2bd^2n}+\frac{bn\log(d+ex)}{d^2}$$

Antiderivative was successfully verified.

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

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

Rule 31

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2344

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

Rule 2347

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

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d}$$
$$= -\frac{ex\left(a+b\log(cx^n)\right)}{d^2(d+ex)} + \frac{\int \frac{a+b\log(cx^n)}{x}\,dx}{d^2} - \frac{e\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^2} + \frac{(ben)\int \frac{1}{d+ex}\,dx}{d^2}$$
$$= -\frac{ex\left(a+b\log(cx^n)\right)}{d^2(d+ex)} + \frac{\left(a+b\log(cx^n)\right)^2}{2bd^2n} + \frac{bn\log(d+ex)}{d^2} - \frac{\left(a+b\log(cx^n)\right)\log\left(1\right.}{d^2}$$
$$= -\frac{ex\left(a+b\log(cx^n)\right)}{d^2(d+ex)} + \frac{\left(a+b\log(cx^n)\right)^2}{2bd^2n} + \frac{bn\log(d+ex)}{d^2} - \frac{\left(a+b\log(cx^n)\right)\log\left(1\right.}{d^2}$$

Mathematica [A] time = 0.08, size = 96, normalized size = 1.20

$$\frac{-2\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right) + \frac{2d\left(a+b\log(cx^n)\right)}{d+ex} + \frac{\left(a+b\log(cx^n)\right)^2}{bn} - 2bn\mathrm{Li}_2\left(-\frac{ex}{d}\right) - 2bn(\log(x)-\log(d+ex))}{2d^2}$$

Antiderivative was successfully verified.

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

```
[Out] ((2*d*(a + b*Log[c*x^n]))/(d + e*x) + (a + b*Log[c*x^n])^2/(b*n) - 2*b*n*(L
og[x] - Log[d + e*x]) - 2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 2*b*n*PolyL
og[2, -((e*x)/d)])/(2*d^2)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\log(cx^n)+a}{e^2x^3+2\,dex^2+d^2x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{b\log(cx^n)+a}{(ex+d)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.19, size = 521, normalized size = 6.51

$$\frac{bn\ln\left(-\frac{ex}{d}\right)\ln\left(ex+d\right)}{d^2}-\frac{i\pi b\mathrm{csgn}\left(ic\,x^n\right)^3}{2\left(ex+d\right)d}-\frac{i\pi b\mathrm{csgn}\left(ic\,x^n\right)^3\ln(x)}{2d^2}+\frac{i\pi b\mathrm{csgn}\left(ic\,x^n\right)^3\ln\left(ex+d\right)}{2d^2}+\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgr}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*n/d^2*ln(e*x+d)*ln(-1/d*e*x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)/d^2*ln(e*x+d)-1/2*b*n/d^2*ln(x)^2-b*n/d^2*ln(x)+b*n/d^2*dilog(-1/d*e*x)-
1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*ln(x)+1/2*I*b*Pi*csgn(I*
c*x^n)^3/d^2*ln(e*x+d)+b*ln(x^n)/d/(e*x+d)+b*ln(x^n)/d^2*ln(x)-b*ln(x^n)/d^
2*ln(e*x+d)+b*ln(c)/d^2*ln(x)-b*ln(c)/d^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n
)^3/d/(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^2*ln(x)-1/2*I*b*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)/d/(e*x+d)+b*ln(c)/d/(e*x+d)+a/d^2*ln(x)-a/d^2*ln(e*x
+d)+a/d/(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*ln(e*x+d)+1/2*I*b*
Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
/d^2*ln(x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*ln(x)+1/2*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2/d/(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^
2*ln(e*x+d)+b*n*ln(e*x+d)/d^2
```

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

$$a\left(\frac{1}{dex+d^2}-\frac{\log\left(ex+d\right)}{d^2}+\frac{\log(x)}{d^2}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{e^2x^3+2\,dex^2+d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{a+b\log\left(cx^n\right)}{x\left(d+ex\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.44 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)^2}\,dx$

Optimal. Leaf size=114

$$\frac{e^2x\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)}+\frac{2e\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{a+b\log\left(cx^n\right)}{d^2x}-\frac{2ben\text{Li}_2\left(-\frac{d}{ex}\right)}{d^3}-\frac{ben\log(d+ex)}{d^3}-\frac{bn}{d^2x}$$

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

Rubi [A] time = 0.18, antiderivative size = 134, normalized size of antiderivative = 1.18, number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {44, 2351, 2304, 2301, 2314, 31, 2317, 2391}

$$\frac{2ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}+\frac{e^2x\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{bd^3n}+\frac{2e\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{a+b\log}{d^2x}$$

Antiderivative was successfully verified.

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

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

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex)^2}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^2x^2} - \frac{2e\left(a+b\log(cx^n)\right)}{d^3x} + \frac{e^2\left(a+b\log(cx^n)\right)}{d^2(d+ex)^2} + \frac{2e^2\left(a+b\log(cx^n)\right)}{d^3(d+ex)}\right)$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^2} - \frac{(2e)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^3} + \frac{\left(2e^2\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^3} + \frac{e^2\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^2}$$

$$= -\frac{bn}{d^2x} - \frac{a+b\log(cx^n)}{d^2x} + \frac{e^2x\left(a+b\log(cx^n)\right)}{d^3(d+ex)} - \frac{e\left(a+b\log(cx^n)\right)^2}{bd^3n} + \frac{2e\left(a+b\log(cx^n\right.}{d^3}$$

$$= -\frac{bn}{d^2x} - \frac{a+b\log(cx^n)}{d^2x} + \frac{e^2x\left(a+b\log(cx^n)\right)}{d^3(d+ex)} - \frac{e\left(a+b\log(cx^n)\right)^2}{bd^3n} - \frac{ben\log(d+ex)}{d^3} +$$

Mathematica [A] time = 0.14, size = 120, normalized size = 1.05

$$-\frac{-2e\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right) + \frac{de\left(a+b\log(cx^n)\right)}{d+ex} + \frac{d\left(a+b\log(cx^n)\right)}{x} + \frac{e\left(a+b\log(cx^n)\right)^2}{bn} - 2ben\mathrm{Li}_2\left(-\frac{ex}{d}\right) - ben(\log(x)\,-}{d^3}$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{e^2x^4+2\,dex^3+d^2x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^4 + 2*d*e*x^3 + d^2*x^2), x)
```

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

$$\int \frac{b\log\left(cx^{n}\right) + a}{(ex + d)^{2}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.20, size = 703, normalized size = 6.17

$$\frac{i\pi be\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)\ln(x)}{d^{3}}-\frac{i\pi be\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)\ln\left(ex+d\right)}{d^{3}}-\frac{2be\ln(x)\ln\left(x^{n}\right)}{d^{3}}-$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2*b*ln(x^n)/d^3*e*ln(x)-b*ln(x^n)*e/d^2/(e*x+d)+2*b*ln(x^n)/d^3*e*ln(e*x+d
)-2*b*ln(c)/d^3*e*ln(x)-b*ln(c)*e/d^2/(e*x+d)+2*b*ln(c)/d^3*e*ln(e*x+d)+b*n
/d^3*e*ln(x)^2-2*b*n/d^3*e*dilog(-1/d*e*x)+b*n/d^3*e*ln(x)+I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e*ln(x)-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)/d^3*e*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/x
+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^2/x-I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*e*ln
(x)-b*ln(x^n)/d^2/x-2*b*n/d^3*e*ln(e*x+d)*ln(-1/d*e*x)-I*b*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)^2/d^3*e*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/(e*x+
d)-2*a/d^3*e*ln(x)-a*e/d^2/(e*x+d)+2*a/d^3*e*ln(e*x+d)-b*ln(c)/d^2/x-a/d^2/
x+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*e*ln(e*x+d)+I*b*Pi*csgn(I*c*x^n)^2
*csgn(I*c)/d^3*e*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2/(e*
x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/(e*x+d)-b*n/d^2/x
-I*b*Pi*csgn(I*c*x^n)^3/d^3*e*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)/d^2/x+I*b*Pi*csgn(I*c*x^n)^3/d^3*e*ln(x)-b*e*n*ln(e*x+d)/d^3-1/2*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)^2/d^2/x+1/2*I*b*Pi*csgn(I*c*x^n)^3*e/d^2/(e*x+d)
```

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

$$-a\left(\frac{2\,ex + d}{d^{2}ex^{2} + d^{3}x} - \frac{2\,e\log\left(ex + d\right)}{d^{3}} + \frac{2\,e\log(x)}{d^{3}}\right) + b\int \frac{\log(c) + \log\left(x^{n}\right)}{e^{2}x^{4} + 2\,dex^{3} + d^{2}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*((2*e*x + d)/(d^2*e*x^2 + d^3*x) - 2*e*log(e*x + d)/d^3 + 2*e*log(x)/d^3
) + b*integrate((log(c) + log(x^n))/(e^2*x^4 + 2*d*e*x^3 + d^2*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 65.88, size = 299, normalized size = 2.62

$$\frac{ae^2\left(\begin{cases}\frac{x}{d^2} & \text{for } e=0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{d^2}-\frac{a}{d^2x}+\frac{2ae^2\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{d^3}-\frac{2ae\log(x)}{d^3}-\frac{be^2n\left(\begin{cases}\frac{x}{d^2} & \text{for }\\ -\frac{\log(x)}{de}+\frac{\log\left(\frac{d}{e}+x\right)}{de} & \text{oth}\end{cases}\right)}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*e**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/d**2 - a/(d
**2*x) + 2*a*e**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d**3 -
 2*a*e*log(x)/d**3 - b*e**2*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e)
+ log(d/e + x)/(d*e), True))/d**2 + b*e**2*Piecewise((x/d**2, Eq(e, 0)), (-
1/(d*e + e**2*x), True))*log(c*x**n)/d**2 - b*n/(d**2*x) - b*log(c*x**n)/(d
**2*x) - 2*b*e**2*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) -
polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog
(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0),
 ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2
, e*x*exp_polar(I*pi)/d), True))/e, True))/d**3 + 2*b*e**2*Piecewise((x/d,
Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/d**3 + b*e*n*log(x)**2/d**3
- 2*b*e*log(x)*log(c*x**n)/d**3
```

3.45 $\int \frac{a+b\log(cx^n)}{x^3(d+ex)^2}\,dx$

Optimal. Leaf size=154

$$-\frac{e^3x\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)}-\frac{3e^2\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}+\frac{2e\left(a+b\log\left(cx^n\right)\right)}{d^3x}-\frac{a+b\log\left(cx^n\right)}{2d^2x^2}+\frac{3be^2n\text{Li}_2\left(-\frac{d}{ex}\right)}{d^4}$$

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

Rubi [A] time = 0.21, antiderivative size = 178, normalized size of antiderivative = 1.16, number of steps used = 9, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {44, 2351, 2304, 2301, 2314, 31, 2317, 2391}

$$-\frac{3be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}-\frac{e^3x\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)}+\frac{3e^2\left(a+b\log\left(cx^n\right)\right)^2}{2bd^4n}-\frac{3e^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}+\frac{2e\ldots}{\ldots}$$

Antiderivative was successfully verified.

[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x)^2),x]

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

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex)^2}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^2x^3} - \frac{2e\left(a+b\log(cx^n)\right)}{d^3x^2} + \frac{3e^2\left(a+b\log(cx^n)\right)}{d^4x} - \frac{e^3\left(a+b\log(cx^n)\right)}{d^3(d+ex)^2} - \right.$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d^2} - \frac{(2e)\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^3} + \frac{\left(3e^2\right)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^4} - \frac{\left(3e^3\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^4} -$$

$$= -\frac{bn}{4d^2x^2} + \frac{2ben}{d^3x} - \frac{a+b\log(cx^n)}{2d^2x^2} + \frac{2e\left(a+b\log(cx^n)\right)}{d^3x} - \frac{e^3x\left(a+b\log(cx^n)\right)}{d^4(d+ex)} + \frac{3e^2\left(a\right.}{}$$

$$= -\frac{bn}{4d^2x^2} + \frac{2ben}{d^3x} - \frac{a+b\log(cx^n)}{2d^2x^2} + \frac{2e\left(a+b\log(cx^n)\right)}{d^3x} - \frac{e^3x\left(a+b\log(cx^n)\right)}{d^4(d+ex)} + \frac{3e^2\left(a\right.}{}$$

Mathematica [A] time = 0.22, size = 165, normalized size = 1.07

$$-\frac{\frac{2d^2\left(a+b\log(cx^n)\right)}{x^2} - \frac{4de^2\left(a+b\log(cx^n)\right)}{d+ex} + 12e^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right) - \frac{8de\left(a+b\log(cx^n)\right)}{x} - \frac{6e^2\left(a+b\log(cx^n)\right)^2}{bn} + \frac{bd^2n}{x^2} + }{4d^4}$$

Antiderivative was successfully verified.

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

```
[Out] -1/4*((b*d^2*n)/x^2 - (8*b*d*e*n)/x + (2*d^2*(a + b*Log[c*x^n]))/x^2 - (8*d
*e*(a + b*Log[c*x^n]))/x - (4*d*e^2*(a + b*Log[c*x^n]))/(d + e*x) - (6*e^2*
(a + b*Log[c*x^n])^2)/(b*n) + 4*b*e^2*n*(Log[x] - Log[d + e*x]) + 12*e^2*(a
 + b*Log[c*x^n])*Log[1 + (e*x)/d] + 12*b*e^2*n*PolyLog[2, -((e*x)/d)])/d^4
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{e^2x^5+2\,dex^4+d^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^5 + 2*d*e*x^4 + d^2*x^3), x)
```

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

$$\int \frac{b \log\left(cx^{n}\right) + a}{\left(ex + d\right)^{2} x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.20, size = 910, normalized size = 5.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*ln(c)*e^2/d^3/(e*x+d)+3*b*ln(c)/d^4*e^2*ln(x)-3*b*ln(c)/d^4*e^2*ln(e*x+d)
+2*b*ln(c)/d^3*e/x-b*n/d^4*e^2*ln(x)-3/2*b*n/d^4*e^2*ln(x)^2+3*b*n/d^4*e^2*
dilog(-1/d*e*x)+2*b*ln(x^n)/d^3*e/x-3*b*ln(x^n)/d^4*e^2*ln(e*x+d)+b*ln(x^n)
*e^2/d^3/(e*x+d)+3*b*ln(x^n)/d^4*e^2*ln(x)-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)/d^4*e^2*ln(x)-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3
*e/x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3/(e*x+d)+1/2*I*b*Pi*csgn
(I*c*x^n)^2*csgn(I*c)*e^2/d^3/(e*x+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)/d^2/x^2-3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e^2*ln(e*x+d)+I*
b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*e/x+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d
^3*e/x-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2/x^2-3/2*I*b*Pi*csgn(I*c*x
^n)^3/d^4*e^2*ln(x)-1/2*a/d^2/x^2+1/4*I*b*Pi*csgn(I*c*x^n)^3/d^2/x^2-3/2*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e^2*ln(e*x+d)+3/2*I*b*Pi*csgn(I*c*x^n)
^2*csgn(I*c)/d^4*e^2*ln(x)+3*b*n/d^4*e^2*ln(e*x+d)*ln(-1/d*e*x)-3*a/d^4*e^2
*ln(e*x+d)+2*a/d^3*e/x+a*e^2/d^3/(e*x+d)+3*a/d^4*e^2*ln(x)-1/2*b*ln(c)/d^2/
x^2-1/2*b*ln(x^n)/d^2/x^2+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e^2*ln
(x)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/x^2-1/2*I*b*Pi*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*e^2/d^3/(e*x+d)+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)/d^4*e^2*ln(e*x+d)-1/4*b*n/d^2/x^2+3/2*I*b*Pi*csgn(I*c*x^n)^3/d^4*e
^2*ln(e*x+d)-I*b*Pi*csgn(I*c*x^n)^3/d^3*e/x-1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2/
d^3/(e*x+d)+b*e^2*n*ln(e*x+d)/d^4+2*b*e*n/d^3/x
```

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

$$\frac{1}{2}\, a\left(\frac{6\, e^{2} x^{2} + 3\, d e x - d^{2}}{d^{3} e x^{3} + d^{4} x^{2}} - \frac{6\, e^{2} \log\left(e x + d\right)}{d^{4}} + \frac{6\, e^{2} \log\left(x\right)}{d^{4}}\right) + b \int \frac{\log\left(c\right) + \log\left(x^{n}\right)}{e^{2} x^{5} + 2\, d e x^{4} + d^{2} x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\ln\left(c\,x^{n}\right)}{x^{3}\,{\left(d + e\,x\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 124.81, size = 357, normalized size = 2.32

$$-\frac{a}{2d^2x^2}-\frac{ae^3\left(\begin{cases}\frac{x}{d^2} & \text{for } e=0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{d^3}+\frac{2ae}{d^3x}-\frac{3ae^3\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{d^4}+\frac{3ae^2\log(x)}{d^4}-\frac{bn}{4d^2x^2}-\frac{b\log(cx^n)}{2d^2x^2}+ \cdots$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a/(2*d**2*x**2) - a*e**3*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x),
 True))/d**3 + 2*a*e/(d**3*x) - 3*a*e**3*Piecewise((x/d, Eq(e, 0)), (log(d
+ e*x)/e, True))/d**4 + 3*a*e**2*log(x)/d**4 - b*n/(4*d**2*x**2) - b*log(c*
x**n)/(2*d**2*x**2) + b*e**3*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e)
 + log(d/e + x)/(d*e), True))/d**3 - b*e**3*Piecewise((x/d**2, Eq(e, 0)), (
-1/(d*e + e**2*x), True))*log(c*x**n)/d**3 + 2*b*e*n/(d**3*x) + 2*b*e*log(c
*x**n)/(d**3*x) + 3*b*e**3*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*
log(x) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x)
- polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)),
 ((0, 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) -
polylog(2, e*x*exp_polar(I*pi)/d), True))/e, True))/d**4 - 3*b*e**3*Piecewi
se((x/d, Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/d**4 - 3*b*e**2*n*l
og(x)**2/(2*d**4) + 3*b*e**2*log(x)*log(c*x**n)/d**4
```

3.46 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex)^3}\,dx$

Optimal. Leaf size=149

$$-\frac{d\log\left(\frac{ex}{d}+1\right)\left(6a+6b\log\left(cx^n\right)+5bn\right)}{2e^4}-\frac{x^2\left(3a+3b\log\left(cx^n\right)+bn\right)}{2e^2(d+ex)}-\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{2e(d+ex)^2}+\frac{x(6a+5bn)}{2e^3}+\frac{3b}{}$$

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

Rubi [A] time = 0.22, antiderivative size = 167, normalized size of antiderivative = 1.12, number of steps used = 11, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {43, 2351, 2295, 2319, 44, 2314, 31, 2317, 2391}

$$-\frac{3bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}+\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{2e^4(d+ex)^2}+\frac{3dx\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)}-\frac{3d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{ax}{e^3}+\frac{b}{}$$

Antiderivative was successfully verified.

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

```
[Out] (a*x)/e^3 - (b*n*x)/e^3 - (b*d^2*n)/(2*e^4*(d + e*x)) - (b*d*n*Log[x])/(2*e
^4) + (b*x*Log[c*x^n])/e^3 + (d^3*(a + b*Log[c*x^n]))/(2*e^4*(d + e*x)^2) +
 (3*d*x*(a + b*Log[c*x^n]))/(e^3*(d + e*x)) - (5*b*d*n*Log[d + e*x])/(2*e^4
) - (3*d*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^4 - (3*b*d*n*PolyLog[2, -((
e*x)/d)])/e^4
```

Rule 31

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

Rule 43

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x^3 \left(a+b\log\left(cx^n\right)\right)}{(d+ex)^3}\,dx = \int \left(\frac{a+b\log\left(cx^n\right)}{e^3} - \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)^3} + \frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)^2} - \frac{3d\left(a+b\log\left(cx\right.\right.}{e^3(d+ex)}\right.$$

$$= \frac{\int \left(a+b\log\left(cx^n\right)\right)dx}{e^3} - \frac{(3d)\int \frac{a+b\log(cx^n)}{d+ex}dx}{e^3} + \frac{\left(3d^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}dx}{e^3} - \frac{d^3\int \frac{a+b\log(c}{(d+ex)}}{e^3}$$

$$= \frac{ax}{e^3} + \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{2e^4(d+ex)^2} + \frac{3dx\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)} - \frac{3d\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e^4}$$

$$= \frac{ax}{e^3} - \frac{bnx}{e^3} + \frac{bx\log\left(cx^n\right)}{e^3} + \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{2e^4(d+ex)^2} + \frac{3dx\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)} - \frac{3bdn\log(}{e^4}$$

$$= \frac{ax}{e^3} - \frac{bnx}{e^3} - \frac{bd^2n}{2e^4(d+ex)} - \frac{bdn\log(x)}{2e^4} + \frac{bx\log\left(cx^n\right)}{e^3} + \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{2e^4(d+ex)^2} + \frac{3dx\left(a\right.}{e}$$

Mathematica [A] time = 0.14, size = 150, normalized size = 1.01

$$\frac{\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2} - \frac{6d^2\left(a+b\log\left(cx^n\right)\right)}{d+ex} - 6d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right) + 2aex + 2bex\log\left(cx^n\right) - 6bdn\mathrm{Li}_2\left(-\frac{ex}{d}\right) + 6bd}{2e^4}$$

Antiderivative was successfully verified.

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

```
[Out] (2*a*e*x - 2*b*e*n*x + 2*b*e*x*Log[c*x^n] + (d^3*(a + b*Log[c*x^n]))/(d + e
*x)^2 - (6*d^2*(a + b*Log[c*x^n]))/(d + e*x) + 6*b*d*n*(Log[x] - Log[d + e*
```

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

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^3 \log(cx^n) + ax^3}{e^3x^3 + 3\,de^2x^2 + 3\,d^2ex + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{\left(b\log(cx^n) + a\right)x^3}{(ex+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.21, size = 764, normalized size = 5.13

$$\frac{3bdn\,\text{dilog}\left(-\frac{ex}{d}\right)}{e^4} - \frac{3b\,d^2\ln(x^n)}{(ex+d)\,e^4} - \frac{3bd\ln(x^n)\ln(ex+d)}{e^4} + \frac{b\,d^3\ln(x^n)}{2\,(ex+d)^2\,e^4} - \frac{3b\,d^2\ln(c)}{(ex+d)\,e^4} - \frac{3bd\ln(c)\ln(ex+d)}{e^4} + \frac{b}{2\,(e}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -3*b*ln(x^n)/e^4*d^2/(e*x+d)-3*b*ln(x^n)/e^4*d*ln(e*x+d)+1/2*b*ln(x^n)*d^3/
e^4/(e*x+d)^2-3*b*ln(c)/e^4*d^2/(e*x+d)-3*b*ln(c)/e^4*d*ln(e*x+d)+1/2*b*ln(
c)*d^3/e^4/(e*x+d)^2+5/2*b*n/e^4*d*ln(e*x)-5/2*b*n/e^4*d*ln(e*x+d)-1/2*b*n/
e^4*d^2/(e*x+d)+3*b*n/e^4*d*dilog(-1/d*e*x)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)*d^3/e^4/(e*x+d)^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^
3/e^4/(e*x+d)^2+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^3/e^4/(e*x+d)^2-3/2*
I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^4*d^2/(e*x+d)-3/2*I*b*Pi*csgn(I*c*x^n)
^2*csgn(I*c)/e^4*d*ln(e*x+d)-3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^4*d^2/(
e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^3*x+1/2*a*d^3/e^4/(
e*x+d)^2-3*a/e^4*d^2/(e*x+d)-3*a/e^4*d*ln(e*x+d)+b*ln(c)/e^3*x-b*n/e^4*d+b*
ln(x^n)/e^3*x-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^3*x+3*b*n/e^4*d*ln(e*x+d)*ln(-1/
d*e*x)+a/e^3*x-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^4*d*ln(e*x+d)+3/2*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^4*d*ln(e*x+d)+3/2*I*b*Pi*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^4*d^2/(e*x+d)-b*n*x/e^3+1/2*I*b*Pi*csgn(I*c
*x^n)^2*csgn(I*c)/e^3*x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^3*x-1/4*I*
b*Pi*csgn(I*c*x^n)^3*d^3/e^4/(e*x+d)^2+3/2*I*b*Pi*csgn(I*c*x^n)^3/e^4*d^2/(
e*x+d)+3/2*I*b*Pi*csgn(I*c*x^n)^3/e^4*d*ln(e*x+d)
```

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

$$-\frac{1}{2}\,a\left(\frac{6\,d^2ex + 5\,d^3}{e^6x^2 + 2\,de^5x + d^2e^4} - \frac{2\,x}{e^3} + \frac{6\,d\log(ex+d)}{e^4}\right) + b\int \frac{x^3\log(c) + x^3\log(x^n)}{e^3x^3 + 3\,de^2x^2 + 3\,d^2ex + d^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(d+e\,x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 48.37, size = 372, normalized size = 2.50

$$-\frac{ad^3\left(\begin{cases}\frac{x}{d^3} & \text{for } e=0\\ -\frac{1}{2e(d+ex)^2} & \text{otherwise}\end{cases}\right)}{e^3}+\frac{3ad^2\left(\begin{cases}\frac{x}{d^2} & \text{for } e=0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{e^3}-\frac{3ad\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{e^3}+\frac{ax}{e^3}+\frac{bd^3n\left(\begin{cases}\frac{x}{d^3} \\ -\frac{}{2}\end{cases}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d**3*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/e**3 +
 3*a*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**3 - 3
*a*d*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**3 + a*x/e**3 + b
*d**3*n*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)/
(2*d**2*e) + log(d/e + x)/(2*d**2*e), True))/e**3 - b*d**3*Piecewise((x/d**
3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*log(c*x**n)/e**3 - 3*b*d**2*n*
Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) + log(d/e + x)/(d*e), True))/e
**3 + 3*b*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))*log
(c*x**n)/e**3 + 3*b*d*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x
) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - pol
ylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0,
 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polyl
og(2, e*x*exp_polar(I*pi)/d), True))/e, True))/e**3 - 3*b*d*Piecewise((x/d,
 Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/e**3 - b*n*x/e**3 + b*x*log
(c*x**n)/e**3
```

3.47 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex)^3} dx$

Optimal. Leaf size=107

$$\frac{\log\left(\frac{ex}{d}+1\right)\left(2a+2b\log\left(cx^n\right)+3bn\right)}{2e^3}-\frac{x\left(2a+2b\log\left(cx^n\right)+bn\right)}{2e^2(d+ex)}-\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e(d+ex)^2}+\frac{bn\text{Li}_2\left(-\frac{ex}{d}\right)}{e^3}$$

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

Rubi [A] time = 0.18, antiderivative size = 132, normalized size of antiderivative = 1.23, number of steps used = 9, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {43, 2351, 2319, 44, 2314, 31, 2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2e^3(d+ex)^2}-\frac{2x\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)}+\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{bdn}{2e^3(d+ex)}+\cdots$$

Antiderivative was successfully verified.

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

```
[Out] (b*d*n)/(2*e^3*(d + e*x)) + (b*n*Log[x])/(2*e^3) - (d^2*(a + b*Log[c*x^n]))
/(2*e^3*(d + e*x)^2) - (2*x*(a + b*Log[c*x^n]))/(e^2*(d + e*x)) + (3*b*n*Lo
g[d + e*x])/(2*e^3) + ((a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^3 + (b*n*Poly
Log[2, -((e*x)/d)])/e^3
```

Rule 31

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

Rule 43

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x^2 \left(a+b\log\left(cx^n\right)\right)}{(d+ex)^3}\,dx = \int \left(\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)^3} - \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)^2} + \frac{a+b\log\left(cx^n\right)}{e^2(d+ex)}\right)dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^2} - \frac{(2d)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^2} + \frac{d^2\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{e^2}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2e^3(d+ex)^2} - \frac{2x\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e^3} - \frac{(bn)\int$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2e^3(d+ex)^2} - \frac{2x\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)} + \frac{2bn\log(d+ex)}{e^3} + \frac{\left(a+b\log\left(cx^n\right)\right)\text{lo}}{e^3}$$

$$= \frac{bdn}{2e^3(d+ex)} + \frac{bn\log(x)}{2e^3} - \frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2e^3(d+ex)^2} - \frac{2x\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)} + \frac{3bn\log(d+}{2e^3}$$

Mathematica [A] time = 0.12, size = 122, normalized size = 1.14

$$\frac{-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2} + \frac{4d\left(a+b\log\left(cx^n\right)\right)}{d+ex} + 2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right) + 2bn\text{Li}_2\left(-\frac{ex}{d}\right) - 4bn(\log(x)-\log(d+ex)) + b}{2e^3}$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\log\left(cx^n\right)+ax^2}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{\left(b \log\left(cx^{n}\right) + a\right)x^{2}}{\left(ex + d\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.18, size = 596, normalized size = 5.57

$$-\frac{i\pi bd \operatorname{csgn}\left(ic\right) \operatorname{csgn}\left(ix^{n}\right) \operatorname{csgn}\left(ic\,x^{n}\right)}{\left(ex+d\right)e^{3}}+\frac{2bd\ln(c)}{\left(ex+d\right)e^{3}}-\frac{b\,d^{2}\ln(c)}{2\left(ex+d\right)^{2}e^{3}}+\frac{bdn}{2\left(ex+d\right)e^{3}}-\frac{bn\ln\left(-\frac{ex}{d}\right)\ln\left(ex+d\right)}{e^{3}}+\frac{2bd}{(ex}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2*b*ln(c)*d/e^3/(e*x+d)-1/2*b*ln(c)*d^2/e^3/(e*x+d)^2+1/2*b*n*d/e^3/(e*x+d)
-b*n/e^3*ln(e*x+d)*ln(-1/d*e*x)+2*b*ln(x^n)*d/e^3/(e*x+d)-1/2*b*ln(x^n)*d^2
/e^3/(e*x+d)^2-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^3/(e*x+d)+1/4
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^3/(e*x+d)^2+I*b*Pi*csgn(I
*c*x^n)^2*csgn(I*c)*d/e^3/(e*x+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^
2/e^3/(e*x+d)^2-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^3/(e*x+d)^2+I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^3/(e*x+d)+a/e^3*ln(e*x+d)-1/2*I*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^3*ln(e*x+d)+b*ln(x^n)/e^3*ln(e*x+d)-1/2*
a*d^2/e^3/(e*x+d)^2+2*a*d/e^3/(e*x+d)+b*ln(c)/e^3*ln(e*x+d)-1/2*I*b*Pi*csgn
(I*c*x^n)^3/e^3*ln(e*x+d)-3/2*b*n/e^3*ln(e*x)+3/2*b*n/e^3*ln(e*x+d)-b*n/e^3
*dilog(-1/d*e*x)-I*b*Pi*csgn(I*c*x^n)^3*d/e^3/(e*x+d)+1/2*I*b*Pi*csgn(I*c*x
^n)^2*csgn(I*c)/e^3*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^3*ln
(e*x+d)+1/4*I*b*Pi*csgn(I*c*x^n)^3*d^2/e^3/(e*x+d)^2
```

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

$$\frac{1}{2}\,a\left(\frac{4\,dex+3\,d^{2}}{e^{5}x^{2}+2\,de^{4}x+d^{2}e^{3}}+\frac{2\,\log\left(ex+d\right)}{e^{3}}\right)+b\int\frac{x^{2}\log(c)+x^{2}\log\left(x^{n}\right)}{e^{3}x^{3}+3\,de^{2}x^{2}+3\,d^{2}ex+d^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*a*((4*d*e*x + 3*d^2)/(e^5*x^2 + 2*d*e^4*x + d^2*e^3) + 2*log(e*x + d)/e
^3) + b*integrate((x^2*log(c) + x^2*log(x^n))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^
2*e*x + d^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^{2}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{\left(d+e\,x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] int((x^2*(a + b*log(c*x^n)))/(d + e*x)^3, x)

sympy [A] time = 45.23, size = 328, normalized size = 3.07

$$\frac{ad^2\left(\begin{cases}\frac{x}{d^3} & \text{for } e=0\\ -\frac{1}{2e(d+ex)^2} & \text{otherwise}\end{cases}\right)}{e^2}-\frac{2ad\left(\begin{cases}\frac{x}{d^2} & \text{for } e=0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{e^2}+\frac{a\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{e^2}-\frac{bd^2n\left(\begin{cases}\frac{x}{d^3} & \\ -\frac{1}{2d^2e+2de^2x} - & \end{cases}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/e**2 -
2*a*d*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**2 + a*Pie
cewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**2 - b*d**2*n*Piecewise((
x/d**3, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/
e + x)/(2*d**2*e), True))/e**2 + b*d**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(
2*e*(d + e*x)**2), True))*log(c*x**n)/e**2 + 2*b*d*n*Piecewise((x/d**2, Eq(
e, 0)), (-log(x)/(d*e) + log(d/e + x)/(d*e), True))/e**2 - 2*b*d*Piecewise(
(x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))*log(c*x**n)/e**2 - b*n*Piece
wise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(
I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d
), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg
(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d),
 True))/e, True))/e**2 + b*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True
))*log(c*x**n)/e**2
```

3.48 $\int \frac{x\left(a+b\log(cx^n)\right)}{(d+ex)^3}\,dx$

Optimal. Leaf size=62

$$\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d(d+ex)^2}-\frac{bn}{2e^2(d+ex)}-\frac{bn\log(d+ex)}{2de^2}$$

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

Rubi [A] time = 0.05, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2335, 43}

$$\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d(d+ex)^2}-\frac{bn}{2e^2(d+ex)}-\frac{bn\log(d+ex)}{2de^2}$$

Antiderivative was successfully verified.

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

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

Rule 43

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

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^3}\,dx &= \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d(d+ex)^2}-\frac{(bn)\int \frac{x}{(d+ex)^2}\,dx}{2d}\\
&= \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d(d+ex)^2}-\frac{(bn)\int \left(-\frac{d}{e(d+ex)^2}+\frac{1}{e(d+ex)}\right)dx}{2d}\\
&= -\frac{bn}{2e^2(d+ex)}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d(d+ex)^2}-\frac{bn\log(d+ex)}{2de^2}
\end{aligned}$$

Mathematica [A] time = 0.12, size = 75, normalized size = 1.21

$$\frac{bn\log(x)-\frac{ad(d+2ex)+bd(d+2ex)\log(cx^n)+bdn(d+ex)+bn(d+ex)^2\log(d+ex)}{(d+ex)^2}}{2de^2}$$

Antiderivative was successfully verified.

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

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

fricas [B] time = 0.58, size = 115, normalized size = 1.85

$$\frac{be^2nx^2\log(x) - bd^2n - ad^2 - (bden + 2\,ade)x - \left(be^2nx^2 + 2\,bdenx + bd^2n\right)\log(ex + d) - \left(2\,bdex + bd^2\right)\log(c)}{2\left(de^4x^2 + 2\,d^2e^3x + d^3e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [B] time = 0.39, size = 122, normalized size = 1.97

$$-\frac{bnx^2e^2\log(xe + d) + 2\,bdnxe\log(xe + d) - bnx^2e^2\log(x) + bdnxe + bd^2n\log(xe + d) + 2\,bdxe\log(c) + bd^2n +}{2\left(dx^2e^4 + 2\,d^2xe^3 + d^3e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.22, size = 349, normalized size = 5.63

$$-\frac{(2ex + d)\,b\ln(x^n)}{2\,(ex + d)^2\,e^2} - \frac{-2i\pi bdex\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n) + 2i\pi bdex\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2 + 2i\pi bdex\,\mathrm{csgn}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b*(2*e*x+d)/(e*x+d)^2/e^2*ln(x^n)-1/4*(-2*I*Pi*b*d*e*x*csgn(I*c*x^n)^3
+I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x
^n)^2-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d^2*csgn(I*c*x^
n)^3+2*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d^2*csgn(I*x^n)*csgn(I
*c*x^n)^2-2*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*ln(e*x+d)*b*
e^2*n*x^2-2*ln(-x)*b*e^2*n*x^2+4*ln(e*x+d)*b*d*e*n*x-4*ln(-x)*b*d*e*n*x+4*b
*d*e*x*ln(c)+2*ln(e*x+d)*b*d^2*n-2*ln(-x)*b*d^2*n+2*b*d*e*n*x+2*b*d^2*ln(c)
+4*a*d*e*x+2*b*d^2*n+2*a*d^2)/d/e^2/(e*x+d)^2
```

maxima [B] time = 0.61, size = 114, normalized size = 1.84

$$-\frac{1}{2}\,bn\left(\frac{1}{e^3x + de^2} + \frac{\log(ex + d)}{de^2} - \frac{\log(x)}{de^2}\right) - \frac{(2\,ex + d)b\log(cx^n)}{2\left(e^4x^2 + 2\,de^3x + d^2e^2\right)} - \frac{(2\,ex + d)a}{2\left(e^4x^2 + 2\,de^3x + d^2e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 4.03, size = 108, normalized size = 1.74

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] - (a*d + x*(2*a*e + b*e*n) + b*d*n)/(2*d^2*e^2 + 2*e^4*x^2 + 4*d*e^3*x) - (
log(c*x^n)*((b*d)/(2*e^2) + (b*x)/e))/(d^2 + e^2*x^2 + 2*d*e*x) - (b*n*atan
h((2*e*x)/d + 1))/(d*e^2)
```

sympy [A] time = 6.04, size = 456, normalized size = 7.35

$$\begin{cases} \tilde{\infty}\left(-\frac{a}{x}-\frac{bn\log\left(x\right)}{x}-\frac{bn}{x}-\frac{b\log\left(c\right)}{x}\right) \\ \frac{-\frac{a}{x}-\frac{bn\log\left(x\right)}{x}-\frac{bn}{x}-\frac{b\log\left(c\right)}{x}}{e^3} \\ \frac{\frac{ax^2}{2}+\frac{bnx^2\log\left(x\right)}{2}-\frac{bnx^2}{4}+\frac{bx^2\log\left(c\right)}{2}}{d^3} \\ -\frac{ad^2}{2d^3e^2+4d^2e^3x+2de^4x^2}-\frac{2adex}{2d^3e^2+4d^2e^3x+2de^4x^2}-\frac{bd^2n\log\left(\frac{d}{e}+x\right)}{2d^3e^2+4d^2e^3x+2de^4x^2}-\frac{bd^2n}{2d^3e^2+4d^2e^3x+2de^4x^2}-\frac{2bdenx\log\left(\frac{d}{e}+x\right)}{2d^3e^2+4d^2e^3x+2de^4x^2}-\frac{b}{2d^3e^2+4d}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((zoo*(-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x), Eq(d, 0) & Eq(e,
 0)), ((-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x)/e**3, Eq(d, 0)), ((a*x**2
/2 + b*n*x**2*log(x)/2 - b*n*x**2/4 + b*x**2*log(c)/2)/d**3, Eq(e, 0)), (-a
*d**2/(2*d**3*e**2 + 4*d**2*e**3*x + 2*d*e**4*x**2) - 2*a*d*e*x/(2*d**3*e**
2 + 4*d**2*e**3*x + 2*d*e**4*x**2) - b*d**2*n*log(d/e + x)/(2*d**3*e**2 + 4
*d**2*e**3*x + 2*d*e**4*x**2) - b*d**2*n/(2*d**3*e**2 + 4*d**2*e**3*x + 2*d
*e**4*x**2) - 2*b*d*e*n*x*log(d/e + x)/(2*d**3*e**2 + 4*d**2*e**3*x + 2*d*e
**4*x**2) - b*d*e*n*x/(2*d**3*e**2 + 4*d**2*e**3*x + 2*d*e**4*x**2) + b*e**
2*n*x**2*log(x)/(2*d**3*e**2 + 4*d**2*e**3*x + 2*d*e**4*x**2) - b*e**2*n*x*
*2*log(d/e + x)/(2*d**3*e**2 + 4*d**2*e**3*x + 2*d*e**4*x**2) + b*e**2*x**2
*log(c)/(2*d**3*e**2 + 4*d**2*e**3*x + 2*d*e**4*x**2), True))
```

3.49 $\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx$

Optimal. Leaf size=76

$$-\frac{a+b\log(cx^n)}{2e(d+ex)^2}+\frac{bn\log(x)}{2d^2e}-\frac{bn\log(d+ex)}{2d^2e}+\frac{bn}{2de(d+ex)}$$

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

Rubi [A] time = 0.03, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2319, 44}

$$-\frac{a+b\log(cx^n)}{2e(d+ex)^2}+\frac{bn\log(x)}{2d^2e}-\frac{bn\log(d+ex)}{2d^2e}+\frac{bn}{2de(d+ex)}$$

Antiderivative was successfully verified.

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

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2319

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

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx &= -\frac{a+b\log(cx^n)}{2e(d+ex)^2}+\frac{(bn)\int \frac{1}{x(d+ex)^2}\,dx}{2e}\\
&= -\frac{a+b\log(cx^n)}{2e(d+ex)^2}+\frac{(bn)\int \left(\frac{1}{d^2x}-\frac{e}{d(d+ex)^2}-\frac{e}{d^2(d+ex)}\right)dx}{2e}\\
&= \frac{bn}{2de(d+ex)}+\frac{bn\log(x)}{2d^2e}-\frac{a+b\log(cx^n)}{2e(d+ex)^2}-\frac{bn\log(d+ex)}{2d^2e}
\end{aligned}$$

Mathematica [A] time = 0.06, size = 53, normalized size = 0.70

$$\frac{\frac{bn\left(\frac{d}{d+ex}-\log(d+ex)+\log(x)\right)}{d^2}-\frac{a+b\log(cx^n)}{(d+ex)^2}}{2e}$$

Antiderivative was successfully verified.

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

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

fricas [A] time = 0.59, size = 107, normalized size = 1.41

$$\frac{bdenx + bd^2n - bd^2\log(c) - ad^2 - \left(be^2nx^2 + 2\,bdenx + bd^2n\right)\log\left(ex + d\right) + \left(be^2nx^2 + 2\,bdenx\right)\log(x)}{2\left(d^2e^3x^2 + 2\,d^3e^2x + d^4e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [A] time = 0.30, size = 120, normalized size = 1.58

$$-\frac{bnx^2e^2\log\left(xe + d\right) + 2\,bdnxe\log\left(xe + d\right) - bnx^2e^2\log(x) - 2\,bdnxe\log(x) - bdnxe + bd^2n\log\left(xe + d\right) - bd}{2\left(d^2x^2e^3 + 2\,d^3xe^2 + d^4e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.20, size = 235, normalized size = 3.09

$$-\frac{b\ln\left(x^n\right)}{2\left(ex + d\right)^2 e} - \frac{-2b\,e^2n\,x^2\ln\left(-x\right) + 2b\,e^2n\,x^2\ln\left(ex + d\right) - i\pi b\,d^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right) + i\pi b\,d^2\mathrm{csgn}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b/e/(e*x+d)^2*ln(x^n)-1/4*(I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi
*b*d^2*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-I*Pi*b*d^2*csgn(I*c*x^n)^3+I*Pi*
b*d^2*csgn(I*c)*csgn(I*c*x^n)^2-2*b*e^2*n*x^2*ln(-x)+2*b*e^2*n*x^2*ln(e*x+d
)-4*b*d*e*n*x*ln(-x)+4*b*d*e*n*x*ln(e*x+d)-2*b*d^2*n*ln(-x)+2*b*d^2*n*ln(e*
x+d)-2*b*d*e*n*x+2*b*d^2*ln(c)-2*b*d^2*n+2*a*d^2)/e/d^2/(e*x+d)^2
```

maxima [A] time = 0.56, size = 99, normalized size = 1.30

$$\frac{1}{2}\,bn\left(\frac{1}{de^2x + d^2e} - \frac{\log\left(ex + d\right)}{d^2e} + \frac{\log(x)}{d^2e}\right) - \frac{b\log\left(cx^n\right)}{2\left(e^3x^2 + 2\,de^2x + d^2e\right)} - \frac{a}{2\left(e^3x^2 + 2\,de^2x + d^2e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 4.05, size = 91, normalized size = 1.20

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*n - a + (b*e*n*x)/d)/(2*d^2*e + 2*e^3*x^2 + 4*d*e^2*x) - (b*log(c*x^n))/
(2*e*(d^2 + e^2*x^2 + 2*d*e*x)) - (b*n*atanh((2*e*x)/d + 1))/(d^2*e)
```

sympy [A] time = 6.63, size = 515, normalized size = 6.78

$$\begin{cases} \tilde{\infty}\left(-\frac{a}{2x^2}-\frac{bn\log(x)}{2x^2}-\frac{bn}{4x^2}-\frac{b\log(c)}{2x^2}\right) \\ \frac{-\frac{a}{2x^2}-\frac{bn\log(x)}{2x^2}-\frac{bn}{4x^2}-\frac{b\log(c)}{2x^2}}{e^3} \\ \frac{ax+bnx\log(x)-bnx+bx\log(c)}{d^3} \\ -\frac{ad^2}{2d^4e+4d^3e^2x+2d^2e^3x^2}-\frac{bd^2n\log\left(\frac{d}{e}+x\right)}{2d^4e+4d^3e^2x+2d^2e^3x^2}+\frac{bd^2n}{2d^4e+4d^3e^2x+2d^2e^3x^2}+\frac{2bdenx\log(x)}{2d^4e+4d^3e^2x+2d^2e^3x^2}-\frac{2bdenx\log\left(\frac{d}{e}+x\right)}{2d^4e+4d^3e^2x+2d^2e^3x^2}+\frac{bden}{2d^4e+4d^3e^2x} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((zoo*(-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n/(4*x**2) - b*log(c)
/(2*x**2)), Eq(d, 0) & Eq(e, 0)), ((-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n
/(4*x**2) - b*log(c)/(2*x**2))/e**3, Eq(d, 0)), ((a*x + b*n*x*log(x) - b*n*
x + b*x*log(c))/d**3, Eq(e, 0)), (-a*d**2/(2*d**4*e + 4*d**3*e**2*x + 2*d**
2*e**3*x**2) - b*d**2*n*log(d/e + x)/(2*d**4*e + 4*d**3*e**2*x + 2*d**2*e**
3*x**2) + b*d**2*n/(2*d**4*e + 4*d**3*e**2*x + 2*d**2*e**3*x**2) + 2*b*d*e*
n*x*log(x)/(2*d**4*e + 4*d**3*e**2*x + 2*d**2*e**3*x**2) - 2*b*d*e*n*x*log(
d/e + x)/(2*d**4*e + 4*d**3*e**2*x + 2*d**2*e**3*x**2) + b*d*e*n*x/(2*d**4*
e + 4*d**3*e**2*x + 2*d**2*e**3*x**2) + 2*b*d*e*x*log(c)/(2*d**4*e + 4*d**3
*e**2*x + 2*d**2*e**3*x**2) + b*e**2*n*x**2*log(x)/(2*d**4*e + 4*d**3*e**2*
x + 2*d**2*e**3*x**2) - b*e**2*n*x**2*log(d/e + x)/(2*d**4*e + 4*d**3*e**2*
x + 2*d**2*e**3*x**2) + b*e**2*x**2*log(c)/(2*d**4*e + 4*d**3*e**2*x + 2*d*
*2*e**3*x**2), True))
```

3.50 $\int \frac{a+b\log(cx^n)}{x(d+ex)^3}\,dx$

Optimal. Leaf size=134

$$-\frac{\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{ex\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)}+\frac{a+b\log\left(cx^n\right)}{2d(d+ex)^2}+\frac{bn\text{Li}_2\left(-\frac{d}{ex}\right)}{d^3}+\frac{3bn\log(d+ex)}{2d^3}-\frac{bn\log(x)}{2d^3}$$

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

Rubi [A] time = 0.25, antiderivative size = 156, normalized size of antiderivative = 1.16, number of steps used = 11, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {2347, 2344, 2301, 2317, 2391, 2314, 31, 2319, 44}

$$-\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}-\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{ex\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2bd^3n}+\frac{a+b\log\left(cx^n\right)}{2d(d+ex)^2}\cdots$$

Antiderivative was successfully verified.

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

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

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2344

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

Rule 2347

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

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex)^3}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{d}$$

$$= \frac{a+b\log(cx^n)}{2d(d+ex)^2} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx}{d^2} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^2} - \frac{(bn)\int \frac{1}{x(d+ex)^2}\,dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2d(d+ex)^2} - \frac{ex\left(a+b\log(cx^n)\right)}{d^3(d+ex)} + \frac{\int \frac{a+b\log(cx^n)}{x}\,dx}{d^3} - \frac{e\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^3} - \frac{(bn)\int \left(\frac{1}{d^2x}\right.}{}$$

$$= -\frac{bn}{2d^2(d+ex)} - \frac{bn\log(x)}{2d^3} + \frac{a+b\log(cx^n)}{2d(d+ex)^2} - \frac{ex\left(a+b\log(cx^n)\right)}{d^3(d+ex)} + \frac{\left(a+b\log(cx^n)\right)^2}{2bd^3n} +$$

$$= -\frac{bn}{2d^2(d+ex)} - \frac{bn\log(x)}{2d^3} + \frac{a+b\log(cx^n)}{2d(d+ex)^2} - \frac{ex\left(a+b\log(cx^n)\right)}{d^3(d+ex)} + \frac{\left(a+b\log(cx^n)\right)^2}{2bd^3n} +$$

Mathematica [A] time = 0.13, size = 141, normalized size = 1.05

$$\frac{\frac{d^2\left(a+b\log(cx^n)\right)}{(d+ex)^2} + \frac{2d\left(a+b\log(cx^n)\right)}{d+ex} - 2\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right) + \frac{\left(a+b\log(cx^n)\right)^2}{bn} - 2bn\text{Li}_2\left(-\frac{ex}{d}\right) - 2bn(\log(x) - \log}{2d^3}$$

Antiderivative was successfully verified.

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

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

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

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^3x^4+3\,de^2x^3+3\,d^2ex^2+d^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^4 + 3*d*e^2*x^3 + 3*d^2*e*x^2 + d^3*x),
x)
```

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

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex+d\right)^3x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.20, size = 703, normalized size = 5.25

$$\frac{bn\ln\left(-\frac{ex}{d}\right)\ln\left(ex+d\right)}{d^3}-\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{4\left(ex+d\right)^2d}-\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{2\left(ex+d\right)d^2}-\frac{i\pi b\,\mathrm{csgn}\left(i\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*n/d^3*ln(e*x+d)*ln(-1/d*e*x)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)/d/(e*x+d)^2-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*ln(x)-1/2
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/(e*x+d)+1/4*I*b*Pi*csgn(I*x
^n)*csgn(I*c*x^n)^2/d/(e*x+d)^2-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3*ln(x)+1/2*I*
b*Pi*csgn(I*c*x^n)^3/d^3*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^2/(e*x+d)+1
/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*ln(e*x+d)+a/d^3*ln(x)-a/d
^3*ln(e*x+d)+a/d^2/(e*x+d)+1/2*a/d/(e*x+d)^2+b*ln(c)/d^3*ln(x)-b*ln(c)/d^3*
ln(e*x+d)+b*ln(c)/d^2/(e*x+d)+1/2*b*ln(c)/d/(e*x+d)^2-1/2*b*n/d^3*ln(x)^2+b
*n/d^3*dilog(-1/d*e*x)+b*ln(x^n)/d^3*ln(x)-b*ln(x^n)/d^3*ln(e*x+d)+b*ln(x^n
)/d^2/(e*x+d)+1/2*b*ln(x^n)/d/(e*x+d)^2-1/4*I*b*Pi*csgn(I*c*x^n)^3/d/(e*x+d
)^2-1/2*b*n/d^2/(e*x+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(e*x+d)^2-1/
2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2
*csgn(I*c)/d^2/(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*ln(x)+1/2*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*ln(x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2/d^3*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2/(e*x+d)-3/
2*b*n*ln(x)/d^3+3/2*b*n*ln(e*x+d)/d^3
```

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

$$\frac{1}{2}\,a\left(\frac{2\,ex+3\,d}{d^2e^2x^2+2\,d^3ex+d^4}-\frac{2\,\log\left(ex+d\right)}{d^3}+\frac{2\,\log(x)}{d^3}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{e^3x^4+3\,de^2x^3+3\,d^2ex^2+d^3x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x\,{\left(d+e\,x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 98.14, size = 335, normalized size = 2.50

$$-\frac{ae\left(\begin{cases}\frac{x}{d^3} & \text{for}\ e=0\\ -\frac{1}{2e(d+ex)^2} & \text{otherwise}\end{cases}\right)}{d}-\frac{ae\left(\begin{cases}\frac{x}{d^2} & \text{for}\ e=0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{d^2}-\frac{ae\left(\begin{cases}\frac{x}{d} & \text{for}\ e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{d^3}+\frac{a\log(x)}{d^3}+\frac{be^2n\left(\begin{cases}-\frac{}{e} \\ -\frac{}{2}\end{cases}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*e*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/d - a*e*P
iecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/d**2 - a*e*Piecewis
e((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d**3 + a*log(x)/d**3 + b*e**2*n*
Piecewise((-1/(e**3*x), Eq(d, 0)), (-1/(2*d*e**2 + 2*e**3*x) - log(d + e*x)
/(2*d*e**2), True))/d**2 - b*e**2*Piecewise((1/(e**3*x), Eq(d, 0)), (-1/(2*
d*(d/x + e)**2), True))*log(c*x**n)/d**2 - 2*b*e*n*Piecewise((-1/(e**2*x),
Eq(d, 0)), (-log(d**2 + d*e*x)/(d*e), True))/d**2 + 2*b*e*Piecewise((1/(e**
2*x), Eq(d, 0)), (-1/(d**2/x + d*e), True))*log(c*x**n)/d**2 + b*n*Piecewis
e((-1/(e*x), Eq(d, 0)), (Piecewise((log(e)*log(x) + polylog(2, d*exp_polar(
I*pi)/(e*x)), Abs(x) < 1), (-log(e)*log(1/x) + polylog(2, d*exp_polar(I*pi)
/(e*x)), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + m
eijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) + polylog(2, d*exp_polar(I*pi)
/(e*x)), True))/d, True))/d**2 - b*Piecewise((1/(e*x), Eq(d, 0)), (log(d/x
+ e)/d, True))*log(c*x**n)/d**2
```

3.51 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)^3}\,dx$

Optimal. Leaf size=171

$$\frac{2e^2x\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)}+\frac{3e\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{a+b\log\left(cx^n\right)}{d^3x}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{2d^2(d+ex)^2}-\frac{3ben\text{Li}_2\left(-\frac{d}{ex}\right)}{d^4}+$$

```
[Out] -b*n/d^3/x+1/2*b*e*n/d^3/(e*x+d)+1/2*b*e*n*ln(x)/d^4+(-a-b*ln(c*x^n))/d^3/x
-1/2*e*(a+b*ln(c*x^n))/d^2/(e*x+d)^2+2*e^2*x*(a+b*ln(c*x^n))/d^4/(e*x+d)+3*
e*ln(1+d/e/x)*(a+b*ln(c*x^n))/d^4-5/2*b*e*n*ln(e*x+d)/d^4-3*b*e*n*polylog(2
,-d/e/x)/d^4
```

Rubi [A] time = 0.25, antiderivative size = 193, normalized size of antiderivative = 1.13, number of steps used = 11, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391}

$$\frac{3ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}+\frac{2e^2x\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)}-\frac{3e\left(a+b\log\left(cx^n\right)\right)^2}{2bd^4n}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{2d^2(d+ex)^2}+\frac{3e\log\left(\frac{ex}{d}+1\right)\left(a+\right.}{d^4}$$

Antiderivative was successfully verified.

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

```
[Out] -((b*n)/(d^3*x)) + (b*e*n)/(2*d^3*(d + e*x)) + (b*e*n*Log[x])/(2*d^4) - (a
+ b*Log[c*x^n])/(d^3*x) - (e*(a + b*Log[c*x^n]))/(2*d^2*(d + e*x)^2) + (2*e
^2*x*(a + b*Log[c*x^n]))/(d^4*(d + e*x)) - (3*e*(a + b*Log[c*x^n])^2)/(2*b*
d^4*n) - (5*b*e*n*Log[d + e*x])/(2*d^4) + (3*e*(a + b*Log[c*x^n])*Log[1 + (
e*x)/d])/d^4 + (3*b*e*n*PolyLog[2, -((e*x)/d)])/d^4
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex)^3}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^3x^2} - \frac{3e\left(a+b\log(cx^n)\right)}{d^4x} + \frac{e^2\left(a+b\log(cx^n)\right)}{d^2(d+ex)^3} + \frac{2e^2\left(a+b\log(cx^n)\right)}{d^3(d+ex)^2} +$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^3} - \frac{(3e)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^4} + \frac{\left(3e^2\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^4} + \frac{\left(2e^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^3} +$$

$$= -\frac{bn}{d^3x} - \frac{a+b\log(cx^n)}{d^3x} - \frac{e\left(a+b\log(cx^n)\right)}{2d^2(d+ex)^2} + \frac{2e^2x\left(a+b\log(cx^n)\right)}{d^4(d+ex)} - \frac{3e\left(a+b\log(cx^n\right.}{2bd^4n}$$

$$= -\frac{bn}{d^3x} - \frac{a+b\log(cx^n)}{d^3x} - \frac{e\left(a+b\log(cx^n)\right)}{2d^2(d+ex)^2} + \frac{2e^2x\left(a+b\log(cx^n)\right)}{d^4(d+ex)} - \frac{3e\left(a+b\log(cx^n\right.}{2bd^4n}$$

$$= -\frac{bn}{d^3x} + \frac{ben}{2d^3(d+ex)} + \frac{ben\log(x)}{2d^4} - \frac{a+b\log(cx^n)}{d^3x} - \frac{e\left(a+b\log(cx^n)\right)}{2d^2(d+ex)^2} + \frac{2e^2x\left(a+b\log\right.}{d^4(d+e}$$

Mathematica [A] time = 0.18, size = 173, normalized size = 1.01

$$\frac{-\frac{d^2e\left(a+b\log(cx^n)\right)}{(d+ex)^2} - \frac{4de\left(a+b\log(cx^n)\right)}{d+ex} + 6e\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right) - \frac{2d\left(a+b\log(cx^n)\right)}{x} - \frac{3e\left(a+b\log(cx^n)\right)^2}{bn} + 6ben\mathrm{Li}_2\left(-\right.}{2d^4}$$

Antiderivative was successfully verified.

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

```
[Out] ((-2*b*d*n)/x - (2*d*(a + b*Log[c*x^n]))/x - (d^2*e*(a + b*Log[c*x^n]))/(d
+ e*x)^2 - (4*d*e*(a + b*Log[c*x^n]))/(d + e*x) - (3*e*(a + b*Log[c*x^n])^2
```

```
)/(b*n) + 4*b*e*n*(Log[x] - Log[d + e*x]) + b*e*n*(d/(d + e*x) + Log[x] - L
og[d + e*x]) + 6*e*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] + 6*b*e*n*PolyLog[2,
 -((e*x)/d)])/(2*d^4)
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{3}x^{5}+3\,de^{2}x^{4}+3\,d^{2}ex^{3}+d^{3}x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^5 + 3*d*e^2*x^4 + 3*d^2*e*x^3 + d^3*x^2)
, x)
```

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

$$\int\frac{b\log\left(cx^{n}\right)+a}{\left(ex+d\right)^{3}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.20, size = 894, normalized size = 5.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e*ln(x)+1/4*I*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/(e*x+d)^2-3/2*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)/d^4*e*ln(e*x+d)+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)/d^3*e/(e*x+d)+3/2*b*n/d^4*e*ln(x)^2-3*b*n/d^4*e*dilog(-1/d*e*x)-1/2*b*ln
(c)*e/d^2/(e*x+d)^2-2*b*ln(c)/d^3*e/(e*x+d)-3*b*ln(c)/d^4*e*ln(x)+3*b*ln(c)
/d^4*e*ln(e*x+d)-3*b*ln(x^n)/d^4*e*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3/x-3
/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e*ln(x)-I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)^2/d^3*e/(e*x+d)+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e*ln(e*x
+d)-3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e*ln(x)+3/2*I*b*Pi*csgn(I*c*x^
n)^2*csgn(I*c)/d^4*e*ln(e*x+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2
/(e*x+d)^2-I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*e/(e*x+d)-1/4*I*b*Pi*csgn(I
*c*x^n)^2*csgn(I*c)*e/d^2/(e*x+d)^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)/d^3/x-b*ln(x^n)/d^3/x-a/d^3/x-3*b*n/d^4*e*ln(e*x+d)*ln(-1/d*e*x)-3*
a/d^4*e*ln(x)+3*a/d^4*e*ln(e*x+d)-1/2*a*e/d^2/(e*x+d)^2-2*a/d^3*e/(e*x+d)-b
*ln(c)/d^3/x-1/2*b*ln(x^n)*e/d^2/(e*x+d)^2+3*b*ln(x^n)/d^4*e*ln(e*x+d)-2*b*
ln(x^n)/d^3*e/(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3/x+3/2*I*b*
Pi*csgn(I*c*x^n)^3/d^4*e*ln(x)+I*b*Pi*csgn(I*c*x^n)^3/d^3*e/(e*x+d)-b*n/d^3
/x+1/4*I*b*Pi*csgn(I*c*x^n)^3*e/d^2/(e*x+d)^2-3/2*I*b*Pi*csgn(I*c*x^n)^3/d^
4*e*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3/x+5/2*b*e*n*ln(x)/d^
4-5/2*b*e*n*ln(e*x+d)/d^4+1/2*b*e*n/d^3/(e*x+d)
```

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

$$-\frac{1}{2}\,a\left(\frac{6\,e^{2}x^{2}+9\,dex+2\,d^{2}}{d^{3}e^{2}x^{3}+2\,d^{4}ex^{2}+d^{5}x}-\frac{6\,e\log\left(ex+d\right)}{d^{4}}+\frac{6\,e\log(x)}{d^{4}}\right)+b\int\frac{\log(c)+\log\left(x^{n}\right)}{e^{3}x^{5}+3\,de^{2}x^{4}+3\,d^{2}ex^{3}+d^{3}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\ln\left(c\,x^n\right)}{x^2\,\left(d + e\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 104.14, size = 425, normalized size = 2.49

$$\frac{ae^2\left(\begin{cases}\frac{x}{d^3} & \text{for}\ e = 0\\ -\frac{1}{2e(d+ex)^2} & \text{otherwise}\end{cases}\right)}{d^2} + \frac{2ae^2\left(\begin{cases}\frac{x}{d^2} & \text{for}\ e = 0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{d^3} - \frac{a}{d^3x} + \frac{3ae^2\left(\begin{cases}\frac{x}{d} & \text{for}\ e = 0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{d^4} - \frac{3ae\log(x)}{d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*e**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/d**2 +
2*a*e**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/d**3 - a/
(d**3*x) + 3*a*e**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d**4
 - 3*a*e*log(x)/d**4 - b*e**2*n*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2*e
 + 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/e + x)/(2*d**2*e), True))/d**2 +
 b*e**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*log(c*
x**n)/d**2 - 2*b*e**2*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) + log(
d/e + x)/(d*e), True))/d**3 + 2*b*e**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d
*e + e**2*x), True))*log(c*x**n)/d**3 - b*n/(d**3*x) - b*log(c*x**n)/(d**3*
x) - 3*b*e**2*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - poly
log(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2,
e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ())
, x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*
x*exp_polar(I*pi)/d), True))/e, True))/d**4 + 3*b*e**2*Piecewise((x/d, Eq(e
, 0)), (log(d + e*x)/e, True))*log(c*x**n)/d**4 + 3*b*e*n*log(x)**2/(2*d**4
) - 3*b*e*log(x)*log(c*x**n)/d**4
```

3.52 $\int \frac{a+b\log(cx^n)}{x^3(d+ex)^3}\,dx$

Optimal. Leaf size=217

$$-\frac{3e^3x\left(a+b\log\left(cx^n\right)\right)}{d^5(d+ex)}-\frac{6e^2\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^5}+\frac{3e\left(a+b\log\left(cx^n\right)\right)}{d^4x}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{2d^3(d+ex)^2}-\frac{a+b\log}{2d^3}$$

```
[Out] -1/4*b*n/d^3/x^2+3*b*e*n/d^4/x-1/2*b*e^2*n/d^4/(e*x+d)-1/2*b*e^2*n*ln(x)/d^
5+1/2*(-a-b*ln(c*x^n))/d^3/x^2+3*e*(a+b*ln(c*x^n))/d^4/x+1/2*e^2*(a+b*ln(c*
x^n))/d^3/(e*x+d)^2-3*e^3*x*(a+b*ln(c*x^n))/d^5/(e*x+d)-6*e^2*ln(1+d/e/x)*(
a+b*ln(c*x^n))/d^5+7/2*b*e^2*n*ln(e*x+d)/d^5+6*b*e^2*n*polylog(2,-d/e/x)/d^
5
```

Rubi [A] time = 0.27, antiderivative size = 239, normalized size of antiderivative = 1.10, number of steps used = 12, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391}

$$-\frac{6be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^5}-\frac{3e^3x\left(a+b\log\left(cx^n\right)\right)}{d^5(d+ex)}+\frac{3e^2\left(a+b\log\left(cx^n\right)\right)^2}{bd^5n}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{2d^3(d+ex)^2}-\frac{6e^2\log\left(\frac{ex}{d}+1\right)}{}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n)/(4*d^3*x^2) + (3*b*e*n)/(d^4*x) - (b*e^2*n)/(2*d^4*(d + e*x)) - (b*e
^2*n*Log[x])/(2*d^5) - (a + b*Log[c*x^n])/(2*d^3*x^2) + (3*e*(a + b*Log[c*x
^n]))/(d^4*x) + (e^2*(a + b*Log[c*x^n]))/(2*d^3*(d + e*x)^2) - (3*e^3*x*(a
+ b*Log[c*x^n]))/(d^5*(d + e*x)) + (3*e^2*(a + b*Log[c*x^n])^2)/(b*d^5*n) +
 (7*b*e^2*n*Log[d + e*x])/(2*d^5) - (6*e^2*(a + b*Log[c*x^n])*Log[1 + (e*x)
/d])/d^5 - (6*b*e^2*n*PolyLog[2, -((e*x)/d)])/d^5
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
```

```
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex)^3}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^3x^3} - \frac{3e\left(a+b\log(cx^n)\right)}{d^4x^2} + \frac{6e^2\left(a+b\log(cx^n)\right)}{d^5x} - \frac{e^3\left(a+b\log(cx^n)\right)}{d^3(d+ex)^3} -$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d^3} - \frac{(3e)\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^4} + \frac{\left(6e^2\right)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^5} - \frac{\left(6e^3\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^5} -$$

$$= -\frac{bn}{4d^3x^2} + \frac{3ben}{d^4x} - \frac{a+b\log(cx^n)}{2d^3x^2} + \frac{3e\left(a+b\log(cx^n)\right)}{d^4x} + \frac{e^2\left(a+b\log(cx^n)\right)}{2d^3(d+ex)^2} - \frac{3e^3x\left(a\right.}{d^5}$$

$$= -\frac{bn}{4d^3x^2} + \frac{3ben}{d^4x} - \frac{a+b\log(cx^n)}{2d^3x^2} + \frac{3e\left(a+b\log(cx^n)\right)}{d^4x} + \frac{e^2\left(a+b\log(cx^n)\right)}{2d^3(d+ex)^2} - \frac{3e^3x\left(a\right.}{d^5}$$

$$= -\frac{bn}{4d^3x^2} + \frac{3ben}{d^4x} - \frac{be^2n}{2d^4(d+ex)} - \frac{be^2n\log(x)}{2d^5} - \frac{a+b\log(cx^n)}{2d^3x^2} + \frac{3e\left(a+b\log(cx^n)\right)}{d^4x} + \frac{e}{}$$

Mathematica [A] time = 0.43, size = 227, normalized size = 1.05

$$-\frac{-\frac{2d^2e^2\left(a+b\log(cx^n)\right)}{(d+ex)^2} + \frac{2d^2\left(a+b\log(cx^n)\right)}{x^2} - \frac{12de^2\left(a+b\log(cx^n)\right)}{d+ex} + 24e^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right) - \frac{12de\left(a+b\log(cx^n)\right)}{x} - \frac{12}{}}{}$$

Antiderivative was successfully verified.

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

```
[Out] -1/4*((b*d^2*n)/x^2 - (12*b*d*e*n)/x + (2*d^2*(a + b*Log[c*x^n]))/x^2 - (12
*d*e*(a + b*Log[c*x^n]))/x - (2*d^2*e^2*(a + b*Log[c*x^n]))/(d + e*x)^2 - (
12*d*e^2*(a + b*Log[c*x^n]))/(d + e*x) - (12*e^2*(a + b*Log[c*x^n])^2)/(b*n
) + 12*b*e^2*n*(Log[x] - Log[d + e*x]) + (2*b*e^2*n*(d + (d + e*x)*Log[x] -
 (d + e*x)*Log[d + e*x]))/(d + e*x) + 24*e^2*(a + b*Log[c*x^n])*Log[1 + (e*
x)/d] + 24*b*e^2*n*PolyLog[2, -((e*x)/d)])/d^5
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{3}x^{6}+3\,de^{2}x^{5}+3\,d^{2}ex^{4}+d^{3}x^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^6 + 3*d*e^2*x^5 + 3*d^2*e*x^4 + d^3*x^3)
, x)
```

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

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex+d\right)^{3}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.22, size = 1119, normalized size = 5.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3/(e*x+d)^2+3*b*ln(c)
/d^4*e/x+3*b*ln(c)/d^4*e^2/(e*x+d)+1/2*b*ln(c)*e^2/d^3/(e*x+d)^2+6*b*ln(c)/
d^5*e^2*ln(x)-6*b*ln(c)/d^5*e^2*ln(e*x+d)-3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)/d^5*e^2*ln(e*x+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3/x^2+
1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3/(e*x+d)^2-3*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)^2/d^5*e^2*ln(e*x+d)+3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^5
*e^2*ln(x)+3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^5*e^2*ln(x)+3/2*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2/d^4*e/x+1/4*I*b*Pi*csgn(I*c*x^n)^3/d^3/x^2-3*b*n/d^
5*e^2*ln(x)^2+6*b*n/d^5*e^2*dilog(-1/d*e*x)-1/2*b*ln(x^n)/d^3/x^2+3*a/d^4*e
/x+3*a/d^4*e^2/(e*x+d)+1/2*a*e^2/d^3/(e*x+d)^2+6*a/d^5*e^2*ln(x)-1/2*b*ln(c
)/d^3/x^2-6*a/d^5*e^2*ln(e*x+d)+6*b*n/d^5*e^2*ln(e*x+d)*ln(-1/d*e*x)-1/2*a/
d^3/x^2+3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e/x-3/2*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)/d^4*e^2/(e*x+d)-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)/d^4*e/x+3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^5*e^2*l
n(e*x+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3/(e*x+d)^2+3/2*I*b*P
i*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e^2/(e*x+d)+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2/d^4*e^2/(e*x+d)+6*b*ln(x^n)/d^5*e^2*ln(x)-3*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)/d^5*e^2*ln(x)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3/
x^2+3*b*ln(x^n)/d^4*e/x-6*b*ln(x^n)/d^5*e^2*ln(e*x+d)+3*b*ln(x^n)/d^4*e^2/(
e*x+d)+1/2*b*ln(x^n)*e^2/d^3/(e*x+d)^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
^2/d^3/x^2-3*I*b*Pi*csgn(I*c*x^n)^3/d^5*e^2*ln(x)-1/4*b*n/d^3/x^2-3/2*I*b*P
i*csgn(I*c*x^n)^3/d^4*e/x+3*I*b*Pi*csgn(I*c*x^n)^3/d^5*e^2*ln(e*x+d)-3/2*I*
b*Pi*csgn(I*c*x^n)^3/d^4*e^2/(e*x+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3/(e*
```

```
x+d)^2-7/2*b*e^2*n*ln(x)/d^5+7/2*b*e^2*n*ln(e*x+d)/d^5+3*b*e*n/d^4/x-1/2*b*
e^2*n/d^4/(e*x+d)
```

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

$$\frac{1}{2}a\left(\frac{12\,e^3x^3+18\,de^2x^2+4\,d^2ex-d^3}{d^4e^2x^4+2\,d^5ex^3+d^6x^2}-\frac{12\,e^2\log\left(ex+d\right)}{d^5}+\frac{12\,e^2\log(x)}{d^5}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{e^3x^6+3\,de^2x^5+3\,d^2ex^4+d^3x^3}\,d$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*a*((12*e^3*x^3 + 18*d*e^2*x^2 + 4*d^2*e*x - d^3)/(d^4*e^2*x^4 + 2*d^5*e
*x^3 + d^6*x^2) - 12*e^2*log(e*x + d)/d^5 + 12*e^2*log(x)/d^5) + b*integrat
e((log(c) + log(x^n))/(e^3*x^6 + 3*d*e^2*x^5 + 3*d^2*e*x^4 + d^3*x^3), x)
```

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

$$\int\frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,{\left(d+e\,x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 110.20, size = 478, normalized size = 2.20

$$-\frac{ae^3\left(\begin{cases}\frac{x}{d^3} & \text{for}\ e=0\\-\frac{1}{2e(d+ex)^2} & \text{otherwise}\end{cases}\right)}{d^3}-\frac{a}{2d^3x^2}-\frac{3ae^3\left(\begin{cases}\frac{x}{d^2} & \text{for}\ e=0\\-\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{d^4}+\frac{3ae}{d^4x}-\frac{6ae^3\left(\begin{cases}\frac{x}{d} & \text{for}\ e=0\\\frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{d^5}+\frac{6}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*e**3*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/d**3 -
 a/(2*d**3*x**2) - 3*a*e**3*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x
), True))/d**4 + 3*a*e/(d**4*x) - 6*a*e**3*Piecewise((x/d, Eq(e, 0)), (log(
d + e*x)/e, True))/d**5 + 6*a*e**2*log(x)/d**5 + b*e**3*n*Piecewise((x/d**3
, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/e + x)
/(2*d**2*e), True))/d**3 - b*e**3*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d
 + e*x)**2), True))*log(c*x**n)/d**3 - b*n/(4*d**3*x**2) - b*log(c*x**n)/(2
*d**3*x**2) + 3*b*e**3*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) + log
(d/e + x)/(d*e), True))/d**4 - 3*b*e**3*Piecewise((x/d**2, Eq(e, 0)), (-1/(
d*e + e**2*x), True))*log(c*x**n)/d**4 + 3*b*e*n/(d**4*x) + 3*b*e*log(c*x**
n)/(d**4*x) + 6*b*e**3*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(
x) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - po
lylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0
, 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - poly
log(2, e*x*exp_polar(I*pi)/d), True))/e, True))/d**5 - 6*b*e**3*Piecewise((
x/d, Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/d**5 - 3*b*e**2*n*log(x
)**2/d**5 + 6*b*e**2*log(x)*log(c*x**n)/d**5
```

3.53 $\int \frac{x^5(a+b\log(cx^n))}{(d+ex)^4}\,dx$

Optimal. Leaf size=229

$$\frac{d^2\log\left(\frac{ex}{d}+1\right)\left(60a+60b\log\left(cx^n\right)+47bn\right)}{6e^6}-\frac{x^3\left(20a+20b\log\left(cx^n\right)+9bn\right)}{6e^3(d+ex)}-\frac{x^4\left(5a+5b\log\left(cx^n\right)+bn\right)}{6e^2(d+ex)^2}-\frac{x^5}{}$$

```
[Out] 10*b*d*n*x/e^5-1/6*d*(47*b*n+60*a)*x/e^5-5/2*b*n*x^2/e^4-10*b*d*x*ln(c*x^n)
/e^5-1/3*x^5*(a+b*ln(c*x^n))/e/(e*x+d)^3-1/6*x^4*(5*a+b*n+5*b*ln(c*x^n))/e^
2/(e*x+d)^2-1/6*x^3*(20*a+9*b*n+20*b*ln(c*x^n))/e^3/(e*x+d)+1/12*x^2*(60*a+
47*b*n+60*b*ln(c*x^n))/e^4+1/6*d^2*(60*a+47*b*n+60*b*ln(c*x^n))*ln(1+e*x/d)
/e^6+10*b*d^2*n*polylog(2,-e*x/d)/e^6
```

Rubi [A] time = 0.32, antiderivative size = 260, normalized size of antiderivative = 1.14, number of steps used = 15, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {43, 2351, 2295, 2304, 2319, 44, 2314, 31, 2317, 2391}

$$\frac{10bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^6}+\frac{d^5\left(a+b\log\left(cx^n\right)\right)}{3e^6(d+ex)^3}-\frac{5d^4\left(a+b\log\left(cx^n\right)\right)}{2e^6(d+ex)^2}-\frac{10d^2x\left(a+b\log\left(cx^n\right)\right)}{e^5(d+ex)}+\frac{10d^2\log\left(\frac{ex}{d}+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] (-4*a*d*x)/e^5 + (4*b*d*n*x)/e^5 - (b*n*x^2)/(4*e^4) - (b*d^4*n)/(6*e^6*(d
+ e*x)^2) + (13*b*d^3*n)/(6*e^6*(d + e*x)) + (13*b*d^2*n*Log[x])/(6*e^6) -
(4*b*d*x*Log[c*x^n])/e^5 + (x^2*(a + b*Log[c*x^n]))/(2*e^4) + (d^5*(a + b*L
og[c*x^n]))/(3*e^6*(d + e*x)^3) - (5*d^4*(a + b*Log[c*x^n]))/(2*e^6*(d + e*
x)^2) - (10*d^2*x*(a + b*Log[c*x^n]))/(e^5*(d + e*x)) + (47*b*d^2*n*Log[d +
 e*x])/(6*e^6) + (10*d^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^6 + (10*b*d
^2*n*PolyLog[2, -((e*x)/d)])/e^6
```

Rule 31

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

Rule 43

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
```

```
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x^5 \left(a+b\log\left(cx^n\right)\right)}{(d+ex)^4}\,dx = \int \left(-\frac{4d\left(a+b\log\left(cx^n\right)\right)}{e^5}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{d^5\left(a+b\log\left(cx^n\right)\right)}{e^5(d+ex)^4}+\frac{5d^4\left(a+b\log\right.}{e^5(d+e}\right.$$

$$= -\frac{(4d)\int\left(a+b\log\left(cx^n\right)\right)dx}{e^5}+\frac{\left(10d^2\right)\int\frac{a+b\log(cx^n)}{d+ex}dx}{e^5}-\frac{\left(10d^3\right)\int\frac{a+b\log(cx^n)}{(d+ex)^2}dx}{e^5}+\frac{(5}{}$$

$$= -\frac{4adx}{e^5}-\frac{bnx^2}{4e^4}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^4}+\frac{d^5\left(a+b\log\left(cx^n\right)\right)}{3e^6(d+ex)^3}-\frac{5d^4\left(a+b\log\left(cx^n\right)\right)}{2e^6(d+ex)^2}$$

$$= -\frac{4adx}{e^5}+\frac{4bdnx}{e^5}-\frac{bnx^2}{4e^4}-\frac{4bdx\log\left(cx^n\right)}{e^5}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^4}+\frac{d^5\left(a+b\log\left(cx^n\right.\right.}{3e^6(d+ex)^3}$$

$$= -\frac{4adx}{e^5}+\frac{4bdnx}{e^5}-\frac{bnx^2}{4e^4}-\frac{bd^4n}{6e^6(d+ex)^2}+\frac{13bd^3n}{6e^6(d+ex)}+\frac{13bd^2n\log(x)}{6e^6}-\frac{4bdx\log(}{e^5}$$

Mathematica [A] time = 0.31, size = 249, normalized size = 1.09

$$\frac{4d^5\left(a+b\log(cx^n)\right)}{(d+ex)^3}-\frac{30d^4\left(a+b\log(cx^n)\right)}{(d+ex)^2}+\frac{120d^3\left(a+b\log(cx^n)\right)}{d+ex}+120d^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)+6e^2x^2\left(a+b\log\left(c\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] (-48*a*d*e*x + 48*b*d*e*n*x - 3*b*e^2*n*x^2 - 48*b*d*e*x*Log[c*x^n] + 6*e^2
*x^2*(a + b*Log[c*x^n]) + (4*d^5*(a + b*Log[c*x^n]))/(d + e*x)^3 - (30*d^4*
(a + b*Log[c*x^n]))/(d + e*x)^2 + (120*d^3*(a + b*Log[c*x^n]))/(d + e*x) -
2*b*d^2*n*((d*(3*d + 2*e*x))/(d + e*x)^2 + 2*Log[x] - 2*Log[d + e*x]) - 120
*b*d^2*n*(Log[x] - Log[d + e*x]) + 30*b*d^2*n*(d/(d + e*x) + Log[x] - Log[d
 + e*x]) + 120*d^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] + 120*b*d^2*n*PolyLo
g[2, -((e*x)/d)])/(12*e^6)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^5\log\left(cx^n\right)+ax^5}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b*x^5*log(c*x^n) + a*x^5)/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2
+ 4*d^3*e*x + d^4), x)
```

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

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x^5}{\left(ex+d\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x + d)^4, x)
```

maple [C] time = 0.23, size = 1153, normalized size = 5.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(b*ln(c*x^n)+a)/(e*x+d)^4,x)
```

```
[Out] -5/2*b*ln(c)/e^6*d^4/(e*x+d)^2+10*b*ln(c)/e^6*d^3/(e*x+d)+1/3*b*ln(c)*d^5/e
^6/(e*x+d)^3+10*b*ln(c)/e^6*d^2*ln(e*x+d)-4*b*ln(c)/e^5*x*d-4*b*ln(x^n)/e^5
*x*d-5/2*b*ln(x^n)/e^6*d^4/(e*x+d)^2+10*b*ln(x^n)/e^6*d^3/(e*x+d)+10*b*ln(x
^n)/e^6*d^2*ln(e*x+d)+1/3*b*ln(x^n)*d^5/e^6/(e*x+d)^3-47/6*b*n/e^6*d^2*ln(e
*x)+47/6*b*n/e^6*d^2*ln(e*x+d)+13/6*b*n/e^6*d^3/(e*x+d)-1/6*b*n/e^6*d^4/(e*
x+d)^2-10*b*n/e^6*d^2*dilog(-1/d*e*x)-2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^
5*x*d-2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^5*x*d-5/4*I*b*Pi*csgn(I*c*x^n)
^2*csgn(I*c)/e^6*d^4/(e*x+d)^2+5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^6*d^3
/(e*x+d)-5/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^6*d^4/(e*x+d)^2+1/6*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)^2*d^5/e^6/(e*x+d)^3-1/4*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)/e^4*x^2-1/4*I*b*Pi*csgn(I*c*x^n)^3/e^4*x^2+1/2*a/e^4*x^
2+1/2*b*ln(x^n)/e^4*x^2-10*b*n/e^6*d^2*ln(e*x+d)*ln(-1/d*e*x)+5/4*I*b*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^6*d^4/(e*x+d)^2-5*I*b*Pi*csgn(I*x^n)*cs
```

```
gn(I*c*x^n)*csgn(I*c)/e^6*d^3/(e*x+d)+17/4*b*n/e^6*d^2-4*a/e^5*x*d-5/2*a/e^
6*d^4/(e*x+d)^2+10*a/e^6*d^3/(e*x+d)+1/3*a*d^5/e^6/(e*x+d)^3+10*a/e^6*d^2*l
n(e*x+d)+1/2*b*ln(c)/e^4*x^2+5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^6*d^2*l
n(e*x+d)-5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^6*d^2*ln(e*x+d)-1/6
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^5/e^6/(e*x+d)^3+5*I*b*Pi*csgn
(I*c*x^n)^2*csgn(I*c)/e^6*d^2*ln(e*x+d)+5*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/
e^6*d^3/(e*x+d)+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^5/e^6/(e*x+d)^3+2*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^5*x*d+2*I*b*Pi*csgn(I*c*x^n)^3/e
^5*x*d+5/4*I*b*Pi*csgn(I*c*x^n)^3/e^6*d^4/(e*x+d)^2-5*I*b*Pi*csgn(I*c*x^n)^
3/e^6*d^3/(e*x+d)-5*I*b*Pi*csgn(I*c*x^n)^3/e^6*d^2*ln(e*x+d)-1/6*I*b*Pi*csg
n(I*c*x^n)^3*d^5/e^6/(e*x+d)^3-1/4*b*n*x^2/e^4+1/4*I*b*Pi*csgn(I*c*x^n)^2*c
sgn(I*c)/e^4*x^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^4*x^2+4*b*d*n*x/e
^5
```

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

$$\frac{1}{6}a\left(\frac{60\,d^3e^2x^2+105\,d^4ex+47\,d^5}{e^9x^3+3\,de^8x^2+3\,d^2e^7x+d^3e^6}+\frac{60\,d^2\log\left(ex+d\right)}{e^6}+\frac{3\left(ex^2-8\,dx\right)}{e^5}\right)+b\int\frac{x^5\log(c)+x^5\log\left(x^n\right)}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/6*a*((60*d^3*e^2*x^2 + 105*d^4*e*x + 47*d^5)/(e^9*x^3 + 3*d*e^8*x^2 + 3*d
^2*e^7*x + d^3*e^6) + 60*d^2*log(e*x + d)/e^6 + 3*(e*x^2 - 8*d*x)/e^5) + b*
integrate((x^5*log(c) + x^5*log(x^n))/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^
2 + 4*d^3*e*x + d^4), x)
```

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

$$\int\frac{x^5\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(d+e\,x\right)}^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*log(c*x^n)))/(d + e*x)^4,x)
```

```
[Out] int((x^5*(a + b*log(c*x^n)))/(d + e*x)^4, x)
```

sympy [A] time = 133.88, size = 598, normalized size = 2.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x+d)**4,x)
```

```
[Out] -a*d**5*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))/e**5 +
 5*a*d**4*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/e**5
 - 10*a*d**3*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**5
+ 10*a*d**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**5 - 4*a*d
*x/e**5 + a*x**2/(2*e**4) + b*d**5*n*Piecewise((x/d**4, Eq(e, 0)), (-3*d/(6
*d**4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2) - 2*e*x/(6*d**4*e + 12*d**3*e*
*2*x + 6*d**2*e**3*x**2) - log(x)/(3*d**3*e) + log(d/e + x)/(3*d**3*e), Tru
e))/e**5 - b*d**5*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), Tru
e))*log(c*x**n)/e**5 - 5*b*d**4*n*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2
*e + 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/e + x)/(2*d**2*e), True))/e**5
 + 5*b*d**4*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*lo
g(c*x**n)/e**5 + 10*b*d**3*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) +
 log(d/e + x)/(d*e), True))/e**5 - 10*b*d**3*Piecewise((x/d**2, Eq(e, 0)),
(-1/(d*e + e**2*x), True))*log(c*x**n)/e**5 - 10*b*d**2*n*Piecewise((x/d, E
```

```
q(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(I*pi)/d), Ab
s(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x)
< 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1), ()
), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d), True))/e, T
rue))/e**5 + 10*b*d**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))*l
og(c*x**n)/e**5 + 4*b*d*n*x/e**5 - 4*b*d*x*log(c*x**n)/e**5 - b*n*x**2/(4*e
**4) + b*x**2*log(c*x**n)/(2*e**4)
```

3.54 $\int \frac{x^4(a+b\log(cx^n))}{(d+ex)^4}\,dx$

Optimal. Leaf size=183

$$-\frac{d\log\left(\frac{ex}{d}+1\right)\left(12a+12b\log\left(cx^n\right)+13bn\right)}{3e^5}-\frac{x^2\left(12a+12b\log\left(cx^n\right)+7bn\right)}{6e^3(d+ex)}-\frac{x^3\left(4a+4b\log\left(cx^n\right)+bn\right)}{6e^2(d+ex)^2}-\frac{x^4\left(a\right.}{3}$$

```
[Out] -4*b*n*x/e^4+1/3*(13*b*n+12*a)*x/e^4+4*b*x*ln(c*x^n)/e^4-1/3*x^4*(a+b*ln(c*
x^n))/e/(e*x+d)^3-1/6*x^3*(4*a+b*n+4*b*ln(c*x^n))/e^2/(e*x+d)^2-1/6*x^2*(12
*a+7*b*n+12*b*ln(c*x^n))/e^3/(e*x+d)-1/3*d*(12*a+13*b*n+12*b*ln(c*x^n))*ln(
1+e*x/d)/e^5-4*b*d*n*polylog(2,-e*x/d)/e^5
```

Rubi [A] time = 0.28, antiderivative size = 211, normalized size of antiderivative = 1.15, number of steps used = 14, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {43, 2351, 2295, 2319, 44, 2314, 31, 2317, 2391}

$$-\frac{4bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^5}-\frac{d^4\left(a+b\log\left(cx^n\right)\right)}{3e^5(d+ex)^3}+\frac{2d^3\left(a+b\log\left(cx^n\right)\right)}{e^5(d+ex)^2}+\frac{6dx\left(a+b\log\left(cx^n\right)\right)}{e^4(d+ex)}-\frac{4d\log\left(\frac{ex}{d}+1\right)\left(a+\right.}{e^5}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] (a*x)/e^4 - (b*n*x)/e^4 + (b*d^3*n)/(6*e^5*(d + e*x)^2) - (5*b*d^2*n)/(3*e^
5*(d + e*x)) - (5*b*d*n*Log[x])/(3*e^5) + (b*x*Log[c*x^n])/e^4 - (d^4*(a +
b*Log[c*x^n]))/(3*e^5*(d + e*x)^3) + (2*d^3*(a + b*Log[c*x^n]))/(e^5*(d + e
*x)^2) + (6*d*x*(a + b*Log[c*x^n]))/(e^4*(d + e*x)) - (13*b*d*n*Log[d + e*x
])/(3*e^5) - (4*d*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^5 - (4*b*d*n*PolyL
og[2, -((e*x)/d)])/e^5
```

Rule 31

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

Rule 43

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
```

```
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x^4 \left(a+b\log \left(cx^n\right)\right)}{(d+ex)^4}\,dx = \int \left(\frac{a+b\log \left(cx^n\right)}{e^4}+\frac{d^4 \left(a+b\log \left(cx^n\right)\right)}{e^4(d+ex)^4}-\frac{4d^3 \left(a+b\log \left(cx^n\right)\right)}{e^4(d+ex)^3}+\frac{6d^2 \left(a+b\log\right.}{e^4(d+ex}\right.$$

$$= \frac{\int \left(a+b\log \left(cx^n\right)\right)dx}{e^4}-\frac{(4d)\int \frac{a+b\log(cx^n)}{d+ex}dx}{e^4}+\frac{\left(6d^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}dx}{e^4}-\frac{\left(4d^3\right)\int}{}$$

$$= \frac{ax}{e^4}-\frac{d^4 \left(a+b\log \left(cx^n\right)\right)}{3e^5(d+ex)^3}+\frac{2d^3 \left(a+b\log \left(cx^n\right)\right)}{e^5(d+ex)^2}+\frac{6dx \left(a+b\log \left(cx^n\right)\right)}{e^4(d+ex)}-\frac{4d \left(a\right.}{}$$

$$= \frac{ax}{e^4}-\frac{bnx}{e^4}+\frac{bx\log \left(cx^n\right)}{e^4}-\frac{d^4 \left(a+b\log \left(cx^n\right)\right)}{3e^5(d+ex)^3}+\frac{2d^3 \left(a+b\log \left(cx^n\right)\right)}{e^5(d+ex)^2}+\frac{6dx \left(a\right.}{e^4}$$

$$= \frac{ax}{e^4}-\frac{bnx}{e^4}+\frac{bd^3n}{6e^5(d+ex)^2}-\frac{5bd^2n}{3e^5(d+ex)}-\frac{5bdn\log(x)}{3e^5}+\frac{bx\log \left(cx^n\right)}{e^4}-\frac{d^4 \left(a+b\right.}{3e^5(d}$$

Mathematica [A] time = 0.23, size = 207, normalized size = 1.13

$$\frac{-\frac{2d^4\left(a+b\log(cx^n)\right)}{(d+ex)^3}+\frac{12d^3\left(a+b\log(cx^n)\right)}{(d+ex)^2}-\frac{36d^2\left(a+b\log(cx^n)\right)}{d+ex}-24d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)+6aex+6bex\log\left(cx^n\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] (6*a*e*x - 6*b*e*n*x + 6*b*e*x*Log[c*x^n] - (2*d^4*(a + b*Log[c*x^n]))/(d +
 e*x)^3 + (12*d^3*(a + b*Log[c*x^n]))/(d + e*x)^2 - (36*d^2*(a + b*Log[c*x^
n]))/(d + e*x) + b*d*n*((d*(3*d + 2*e*x))/(d + e*x)^2 + 2*Log[x] - 2*Log[d
+ e*x]) + 36*b*d*n*(Log[x] - Log[d + e*x]) - 12*b*d*n*(d/(d + e*x) + Log[x]
 - Log[d + e*x]) - 24*d*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 24*b*d*n*Poly
Log[2, -((e*x)/d)])/(6*e^5)
```

fricas [F] time = 0.72, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^4\log(cx^n)+ax^4}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b*x^4*log(c*x^n) + a*x^4)/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2
+ 4*d^3*e*x + d^4), x)
```

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

$$\int\frac{\left(b\log(cx^n)+a\right)x^4}{(ex+d)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^4/(e*x + d)^4, x)
```

maple [C] time = 0.22, size = 969, normalized size = 5.30

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(b*ln(c*x^n)+a)/(e*x+d)^4,x)
```

```
[Out] -I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^5*d^3/(e*x+d)^2-4*b*ln(x^n)/e
^5*d*ln(e*x+d)-1/3*b*ln(x^n)*d^4/e^5/(e*x+d)^3+2*b*ln(x^n)/e^5*d^3/(e*x+d)^
2-6*b*ln(x^n)/e^5*d^2/(e*x+d)+13/3*b*n/e^5*d*ln(e*x)+1/6*b*n/e^5*d^3/(e*x+d
)^2-13/3*b*n/e^5*d*ln(e*x+d)-5/3*b*n/e^5*d^2/(e*x+d)+4*b*n/e^5*d*dilog(-1/d
*e*x)+2*b*ln(c)/e^5*d^3/(e*x+d)^2-6*b*ln(c)/e^5*d^2/(e*x+d)-1/3*b*ln(c)*d^4
/e^5/(e*x+d)^3-4*b*ln(c)/e^5*d*ln(e*x+d)+I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e
^5*d^3/(e*x+d)^2+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^5*d^3/(e*x+d)^2-1/6*I
*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^4/e^5/(e*x+d)^3-2*I*b*Pi*csgn(I*c*x^n)^2*
csgn(I*c)/e^5*d*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^
4*x-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^4/e^5/(e*x+d)^3-3*I*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2/e^5*d^2/(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^4*x-2*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^5*d*ln(e*x+d)-3*I*b*Pi*csgn(I*c*x^n)^2*
csgn(I*c)/e^5*d^2/(e*x+d)+4*b*n/e^5*d*ln(e*x+d)*ln(-1/d*e*x)-b*n/e^5*d+b*ln
(x^n)/e^4*x-4*a/e^5*d*ln(e*x+d)-1/3*a*d^4/e^5/(e*x+d)^3+2*a/e^5*d^3/(e*x+d)
^2-6*a/e^5*d^2/(e*x+d)+b*ln(c)/e^4*x+a/e^4*x+1/2*I*b*Pi*csgn(I*c*x^n)^2*csg
n(I*c)/e^4*x+2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^5*d*ln(e*x+d)+1
/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^4/e^5/(e*x+d)^3+3*I*b*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^5*d^2/(e*x+d)-b*n*x/e^4+1/6*I*b*Pi*csgn
(I*c*x^n)^3*d^4/e^5/(e*x+d)^3+2*I*b*Pi*csgn(I*c*x^n)^3/e^5*d*ln(e*x+d)+1/2*
I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^4*x+3*I*b*Pi*csgn(I*c*x^n)^3/e^5*d^2/(
e*x+d)-I*b*Pi*csgn(I*c*x^n)^3/e^5*d^3/(e*x+d)^2
```

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

$$-\frac{1}{3}\,a\left(\frac{18\,d^2e^2x^2+30\,d^3ex+13\,d^4}{e^8x^3+3\,de^7x^2+3\,d^2e^6x+d^3e^5}-\frac{3\,x}{e^4}+\frac{12\,d\log(ex+d)}{e^5}\right)+b\int\frac{x^4\log(c)+x^4\log(x^n)}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] -1/3*a*((18*d^2*e^2*x^2 + 30*d^3*e*x + 13*d^4)/(e^8*x^3 + 3*d*e^7*x^2 + 3*d
^2*e^6*x + d^3*e^5) - 3*x/e^4 + 12*d*log(e*x + d)/e^5) + b*integrate((x^4*l
og(c) + x^4*log(x^n))/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x +
d^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4 \left(a + b \ln\left(c x^n\right)\right)}{\left(d + e x\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*log(c*x^n)))/(d + e*x)^4,x)
```

```
[Out] int((x^4*(a + b*log(c*x^n)))/(d + e*x)^4, x)
```

sympy [A] time = 71.89, size = 544, normalized size = 2.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))/(e*x+d)**4,x)
```

```
[Out] a*d**4*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))/e**4 -
4*a*d**3*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/e**4
+ 6*a*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**4 -
4*a*d*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**4 + a*x/e**4 -
b*d**4*n*Piecewise((x/d**4, Eq(e, 0)), (-3*d/(6*d**4*e + 12*d**3*e**2*x + 6
*d**2*e**3*x**2) - 2*e*x/(6*d**4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2) - l
og(x)/(3*d**3*e) + log(d/e + x)/(3*d**3*e), True))/e**4 + b*d**4*Piecewise(
(x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))*log(c*x**n)/e**4 + 4*b*d
**3*n*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)/(2
*d**2*e) + log(d/e + x)/(2*d**2*e), True))/e**4 - 4*b*d**3*Piecewise((x/d**
3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*log(c*x**n)/e**4 - 6*b*d**2*n*
Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) + log(d/e + x)/(d*e), True))/e
**4 + 6*b*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))*log
(c*x**n)/e**4 + 4*b*d*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x
) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - pol
ylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0,
 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polyl
og(2, e*x*exp_polar(I*pi)/d), True))/e, True))/e**4 - 4*b*d*Piecewise((x/d,
 Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/e**4 - b*n*x/e**4 + b*x*log
(c*x**n)/e**4
```

3.55 $\int \frac{x^3\left(a+b\log(cx^n)\right)}{(d+ex)^4}\,dx$

Optimal. Leaf size=141

$$\frac{\log\left(\frac{ex}{d}+1\right)\left(6a+6b\log\left(cx^n\right)+11bn\right)}{6e^4}-\frac{x\left(6a+6b\log\left(cx^n\right)+5bn\right)}{6e^3(d+ex)}-\frac{x^2\left(3a+3b\log\left(cx^n\right)+bn\right)}{6e^2(d+ex)^2}-\frac{x^3\left(a+b\log(\right.}{3e(d+ex}$$

```
[Out] -1/3*x^3*(a+b*ln(c*x^n))/e/(e*x+d)^3-1/6*x^2*(3*a+b*n+3*b*ln(c*x^n))/e^2/(e
*x+d)^2-1/6*x*(6*a+5*b*n+6*b*ln(c*x^n))/e^3/(e*x+d)+1/6*(6*a+11*b*n+6*b*ln(
c*x^n))*ln(1+e*x/d)/e^4+b*n*polylog(2,-e*x/d)/e^4
```

Rubi [A] time = 0.25, antiderivative size = 178, normalized size of antiderivative = 1.26, number of steps used = 12, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {43, 2351, 2319, 44, 2314, 31, 2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}+\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4(d+ex)^3}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{2e^4(d+ex)^2}-\frac{3x\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)}+\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx\right.}{e^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] -(b*d^2*n)/(6*e^4*(d + e*x)^2) + (7*b*d*n)/(6*e^4*(d + e*x)) + (7*b*n*Log[x
])/(6*e^4) + (d^3*(a + b*Log[c*x^n]))/(3*e^4*(d + e*x)^3) - (3*d^2*(a + b*L
og[c*x^n]))/(2*e^4*(d + e*x)^2) - (3*x*(a + b*Log[c*x^n]))/(e^3*(d + e*x))
 + (11*b*n*Log[d + e*x])/(6*e^4) + ((a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^4
 + (b*n*PolyLog[2, -((e*x)/d)])/e^4
```

Rule 31

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

Rule 43

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x^3 \left(a+b\log\left(cx^n\right)\right)}{(d+ex)^4}\,dx = \int \left(-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)^4}+\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)^3}-\frac{3d\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)^2}+\frac{a+b\log}{e^3(d}\right.$$

$$=\frac{\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^3}-\frac{(3d)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^3}+\frac{\left(3d^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{e^3}-\frac{d^3\int \frac{a+b\log(cx^n)}{(d+ex)^4}}{e^3}$$

$$=\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4(d+ex)^3}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{2e^4(d+ex)^2}-\frac{3x\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)}+\frac{\left(a+b\log\left(c\right.\right.}{}$$

$$=\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4(d+ex)^3}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{2e^4(d+ex)^2}-\frac{3x\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)}+\frac{3bn\log(d+}{e^4}$$

$$=-\frac{bd^2n}{6e^4(d+ex)^2}+\frac{7bdn}{6e^4(d+ex)}+\frac{7bn\log(x)}{6e^4}+\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4(d+ex)^3}-\frac{3d^2\left(a+b\log\right.}{2e^4(d+e}$$

Mathematica [A] time = 0.24, size = 179, normalized size = 1.27

$$\frac{\frac{2d^3\left(a+b\log(cx^n)\right)}{(d+ex)^3}-\frac{9d^2\left(a+b\log(cx^n)\right)}{(d+ex)^2}+\frac{18d\left(a+b\log(cx^n)\right)}{d+ex}+6\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)+6bn\mathrm{Li}_2\left(-\frac{ex}{d}\right)-bn\left(\frac{d(3d+2}{(d+ex)}\right.}{6e^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] ((2*d^3*(a + b*Log[c*x^n]))/(d + e*x)^3 - (9*d^2*(a + b*Log[c*x^n]))/(d + e
*x)^2 + (18*d*(a + b*Log[c*x^n]))/(d + e*x) - b*n*((d*(3*d + 2*e*x))/(d + e
*x)^2 + 2*Log[x] - 2*Log[d + e*x]) - 18*b*n*(Log[x] - Log[d + e*x]) + 9*b*n
*(d/(d + e*x) + Log[x] - Log[d + e*x]) + 6*(a + b*Log[c*x^n])*Log[1 + (e*x)
/d] + 6*b*n*PolyLog[2, -((e*x)/d)])/(6*e^4)
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^3 \log(cx^n) + ax^3}{e^4x^4 + 4\,de^3x^3 + 6\,d^2e^2x^2 + 4\,d^3ex + d^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x^n) + a*x^3)/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2
+ 4*d^3*e*x + d^4), x)
```

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

$$\int \frac{\left(b\log(cx^n) + a\right)x^3}{(ex+d)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x + d)^4, x)
```

maple [C] time = 0.19, size = 801, normalized size = 5.68

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(e*x+d)^4,x)
```

```
[Out] 3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^4/(e*x+d)^2-3/2*I*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^4/(e*x+d)-1/6*I*b*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*d^3/e^4/(e*x+d)^3-3/2*b*ln(x^n)*d^2/e^4/(e*x+d)^2+3*
b*ln(x^n)*d/e^4/(e*x+d)+1/3*b*ln(x^n)*d^3/e^4/(e*x+d)^3-1/6*b*n*d^2/e^4/(e*
x+d)^2-b*n/e^4*ln(e*x+d)*ln(-1/d*e*x)-3/2*b*ln(c)*d^2/e^4/(e*x+d)^2+3*b*ln(
c)*d/e^4/(e*x+d)+1/3*b*ln(c)*d^3/e^4/(e*x+d)^3+7/6*b*n*d/e^4/(e*x+d)-3/4*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^2/e^4/(e*x+d)^2-3/4*I*b*Pi*csgn(I*c*x^n)
^2*csgn(I*c)*d^2/e^4/(e*x+d)^2-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)/e^4*ln(e*x+d)+3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^4/(e*x+d)+1/6*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^3/e^4/(e*x+d)^3+3/2*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)^2*d/e^4/(e*x+d)+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^3/e^4/(e
*x+d)^3+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^4*ln(e*x+d)-1/2*I*b*Pi*csg
n(I*c*x^n)^3/e^4*ln(e*x+d)-3/2*a*d^2/e^4/(e*x+d)^2+3*a*d/e^4/(e*x+d)+1/3*a*
d^3/e^4/(e*x+d)^3+b*ln(c)/e^4*ln(e*x+d)+a/e^4*ln(e*x+d)+b*ln(x^n)/e^4*ln(e*
x+d)-11/6*b*n/e^4*ln(e*x)+11/6*b*n/e^4*ln(e*x+d)-b*n/e^4*dilog(-1/d*e*x)-3/
2*I*b*Pi*csgn(I*c*x^n)^3*d/e^4/(e*x+d)+3/4*I*b*Pi*csgn(I*c*x^n)^3*d^2/e^4/(
e*x+d)^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^4*ln(e*x+d)-1/6*I*b*Pi*csgn
(I*c*x^n)^3*d^3/e^4/(e*x+d)^3
```

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

$$\frac{1}{6}\,a\left(\frac{18\,de^2x^2 + 27\,d^2ex + 11\,d^3}{e^7x^3 + 3\,de^6x^2 + 3\,d^2e^5x + d^3e^4} + \frac{6\,\log(ex+d)}{e^4}\right) + b\int \frac{x^3\log(c) + x^3\log(x^n)}{e^4x^4 + 4\,de^3x^3 + 6\,d^2e^2x^2 + 4\,d^3ex + d^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/6*a*((18*d*e^2*x^2 + 27*d^2*e*x + 11*d^3)/(e^7*x^3 + 3*d*e^6*x^2 + 3*d^2*
e^5*x + d^3*e^4) + 6*log(e*x + d)/e^4) + b*integrate((x^3*log(c) + x^3*log(
x^n))/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,(a+b\,\ln(c\,x^n))}{(d+e\,x)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x)^4,x)
[Out] int((x^3*(a + b*log(c*x^n)))/(d + e*x)^4, x)
```

sympy [A] time = 70.47, size = 500, normalized size = 3.55

$$-\frac{ad^3\left(\begin{cases}\frac{x}{d^4} & \text{for } e=0\\ -\frac{1}{3e(d+ex)^3} & \text{otherwise}\end{cases}\right)}{e^3}+\frac{3ad^2\left(\begin{cases}\frac{x}{d^3} & \text{for } e=0\\ -\frac{1}{2e(d+ex)^2} & \text{otherwise}\end{cases}\right)}{e^3}-\frac{3ad\left(\begin{cases}\frac{x}{d^2} & \text{for } e=0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{e^3}+\frac{a\left(\begin{cases}\frac{x}{d} \\ \frac{\log(d+e}{e}\end{cases}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x+d)**4,x)
[Out] -a*d**3*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))/e**3 +
 3*a*d**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/e**3
 - 3*a*d*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**3 + a*
Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**3 + b*d**3*n*Piecewis
e((x/d**4, Eq(e, 0)), (-3*d/(6*d**4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2)
- 2*e*x/(6*d**4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2) - log(x)/(3*d**3*e)
+ log(d/e + x)/(3*d**3*e), True))/e**3 - b*d**3*Piecewise((x/d**4, Eq(e, 0)
), (-1/(3*e*(d + e*x)**3), True))*log(c*x**n)/e**3 - 3*b*d**2*n*Piecewise((
x/d**3, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/
e + x)/(2*d**2*e), True))/e**3 + 3*b*d**2*Piecewise((x/d**3, Eq(e, 0)), (-1
/(2*e*(d + e*x)**2), True))*log(c*x**n)/e**3 + 3*b*d*n*Piecewise((x/d**2, E
q(e, 0)), (-log(x)/(d*e) + log(d/e + x)/(d*e), True))/e**3 - 3*b*d*Piecewis
e((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))*log(c*x**n)/e**3 - b*n*Pie
cewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_pola
r(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)
/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meije
rg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d
), True))/e, True))/e**3 + b*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, Tr
ue))*log(c*x**n)/e**3
```

3.56 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex)^4}\,dx$

Optimal. Leaf size=79

$$\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d(d+ex)^3}-\frac{2bn}{3e^3(d+ex)}+\frac{bdn}{6e^3(d+ex)^2}-\frac{bn\log(d+ex)}{3de^3}$$

```
[Out] 1/6*b*d*n/e^3/(e*x+d)^2-2/3*b*n/e^3/(e*x+d)+1/3*x^3*(a+b*ln(c*x^n))/d/(e*x+
d)^3-1/3*b*n*ln(e*x+d)/d/e^3
```

Rubi [A] time = 0.07, antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2335, 43}

$$\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d(d+ex)^3}-\frac{2bn}{3e^3(d+ex)}+\frac{bdn}{6e^3(d+ex)^2}-\frac{bn\log(d+ex)}{3de^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] (b*d*n)/(6*e^3*(d + e*x)^2) - (2*b*n)/(3*e^3*(d + e*x)) + (x^3*(a + b*Log[c
*x^n]))/(3*d*(d + e*x)^3) - (b*n*Log[d + e*x])/(3*d*e^3)
```

Rule 43

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

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^4}\,dx &= \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d(d+ex)^3}-\frac{(bn)\int \frac{x^2}{(d+ex)^3}\,dx}{3d}\\ &= \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d(d+ex)^3}-\frac{(bn)\int \left(\frac{d^2}{e^2(d+ex)^3}-\frac{2d}{e^2(d+ex)^2}+\frac{1}{e^2(d+ex)}\right)dx}{3d}\\ &= \frac{bdn}{6e^3(d+ex)^2}-\frac{2bn}{3e^3(d+ex)}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d(d+ex)^3}-\frac{bn\log(d+ex)}{3de^3}\end{aligned}$$

Mathematica [B] time = 0.12, size = 172, normalized size = 2.18

$$-\frac{ad^2}{3e^3(d+ex)^3}+\frac{ad}{e^3(d+ex)^2}-\frac{a}{e^3(d+ex)}-\frac{bd^2\log\left(cx^n\right)}{3e^3(d+ex)^3}+\frac{bd\log\left(cx^n\right)}{e^3(d+ex)^2}-\frac{b\log\left(cx^n\right)}{e^3(d+ex)}+\frac{bdn}{6e^3(d+ex)^2}-\frac{2bn}{3e^3(d+ex)}+\frac{bn}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] -1/3*(a*d^2)/(e^3*(d + e*x)^3) + (a*d)/(e^3*(d + e*x)^2) + (b*d*n)/(6*e^3*(
d + e*x)^2) - a/(e^3*(d + e*x)) - (2*b*n)/(3*e^3*(d + e*x)) + (b*n*Log[x])/
(3*d*e^3) - (b*d^2*Log[c*x^n])/(3*e^3*(d + e*x)^3) + (b*d*Log[c*x^n])/(e^3*
(d + e*x)^2) - (b*Log[c*x^n])/(e^3*(d + e*x)) - (b*n*Log[d + e*x])/(3*d*e^3
)
```

fricas [B] time = 0.70, size = 178, normalized size = 2.25

$$\frac{2\,be^3nx^3\log(x)-3\,bd^3n-2\,ad^3-2\left(2\,bde^2n+3\,ade^2\right)x^2-\left(7\,bd^2en+6\,ad^2e\right)x-2\left(be^3nx^3+3\,bde^2nx^2+3\,b\cdots\right.}{6\left(de^6x^3+3\,d^2e^5x^2+3\,d^3e^4x+d^4e^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] 1/6*(2*b*e^3*n*x^3*log(x) - 3*b*d^3*n - 2*a*d^3 - 2*(2*b*d*e^2*n + 3*a*d*e^
2)*x^2 - (7*b*d^2*e*n + 6*a*d^2*e)*x - 2*(b*e^3*n*x^3 + 3*b*d*e^2*n*x^2 + 3
*b*d^2*e*n*x + b*d^3*n)*log(e*x + d) - 2*(3*b*d*e^2*x^2 + 3*b*d^2*e*x + b*d
^3)*log(c))/(d*e^6*x^3 + 3*d^2*e^5*x^2 + 3*d^3*e^4*x + d^4*e^3)
```

giac [B] time = 0.30, size = 193, normalized size = 2.44

$$-\frac{2\,bnx^3e^3\log\left(xe+d\right)+6\,bdnx^2e^2\log\left(xe+d\right)+6\,bd^2nxe\log\left(xe+d\right)-2\,bnx^3e^3\log(x)+4\,bdnx^2e^2+7\,bd^2n\cdots}{6\left(dx^3e^6+3\,d^2x^2\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] -1/6*(2*b*n*x^3*e^3*log(x*e + d) + 6*b*d*n*x^2*e^2*log(x*e + d) + 6*b*d^2*n
*x*e*log(x*e + d) - 2*b*n*x^3*e^3*log(x) + 4*b*d*n*x^2*e^2 + 7*b*d^2*n*x*e
+ 2*b*d^3*n*log(x*e + d) + 6*b*d*x^2*e^2*log(c) + 6*b*d^2*x*e*log(c) + 3*b*
d^3*n + 6*a*d*x^2*e^2 + 6*a*d^2*x*e + 2*b*d^3*log(c) + 2*a*d^3)/(d*x^3*e^6
+ 3*d^2*x^2*e^5 + 3*d^3*x*e^4 + d^4*e^3)
```

maple [C] time = 0.23, size = 553, normalized size = 7.00

$$-\frac{\left(3e^2x^2+3dex+d^2\right)b\ln\left(x^n\right)}{3\left(ex+d\right)^3e^3}-\frac{6bd\,e^2x^2\ln(c)+6b\,d^2ex\ln(c)+6ad\,e^2x^2+6a\,d^2ex+2a\,d^3+3b\,d^3n+2b\,d^3n\,\mathrm{l}\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(e*x+d)^4,x)
```

```
[Out] -1/3*b*(3*e^2*x^2+3*d*e*x+d^2)/(e*x+d)^3/e^3*ln(x^n)-1/6*(6*b*d*e^2*x^2*ln(
c)+6*b*d^2*e*x*ln(c)+3*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+3*I*Pi*
b*d^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+6*a*d*e^2*x^2+6*a*d^2*e*x+2*a*d^3+3*I*P
i*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*e*x+3*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*
csgn(I*c)+3*b*d^3*n+2*ln(e*x+d)*b*d^3*n-2*ln(-x)*b*d^3*n+2*b*d^3*ln(c)-3*I*
Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b*d^2*e*x*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d^3*csgn(I*c*x^n)^3+2*ln(e*x+d)*b*e^3*n
*x^3-2*ln(-x)*b*e^3*n*x^3+6*ln(e*x+d)*b*d*e^2*n*x^2+6*ln(e*x+d)*b*d^2*e*n*x
-6*ln(-x)*b*d*e^2*n*x^2-6*ln(-x)*b*d^2*e*n*x+I*Pi*b*d^3*csgn(I*c*x^n)^2*csg
n(I*c)+I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d^3*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)-3*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3-3*I*Pi*b*d^2*e*x*csgn(
I*c*x^n)^3+7*b*d^2*e*n*x+4*b*d*e^2*n*x^2)/d/e^3/(e*x+d)^3
```

maxima [B] time = 0.67, size = 179, normalized size = 2.27

$$-\frac{1}{6}\,bn\left(\frac{4\,ex+3\,d}{e^5x^2+2\,de^4x+d^2e^3}+\frac{2\,\log\left(ex+d\right)}{de^3}-\frac{2\,\log(x)}{de^3}\right)-\frac{\left(3\,e^2x^2+3\,dex+d^2\right)b\log\left(cx^n\right)}{3\left(e^6x^3+3\,de^5x^2+3\,d^2e^4x+d^3e^3\right)}-\frac{\left(3\,e^2x^2\cdots\right.}{3\left(e^6x^3+3\,de\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="maxima")
```

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

mupad [B] time = 4.02, size = 167, normalized size = 2.11

$$-\frac{x^2\left(3\,a\,e^2+2\,b\,e^2\,n\right)+a\,d^2+x\,\left(3\,a\,d\,e+\frac{7\,b\,d\,e\,n}{2}\right)+\frac{3\,b\,d^2\,n}{2}}{3\,d^3\,e^3+9\,d^2\,e^4\,x+9\,d\,e^5\,x^2+3\,e^6\,x^3}-\frac{\ln\left(c\,x^n\right)\,\left(\frac{b\,d^2}{3\,e^3}+\frac{b\,x^2}{e}+\frac{b\,d\,x}{e^2}\right)}{d^3+3\,d^2\,e\,x+3\,d\,e^2\,x^2+e^3\,x^3}-\frac{2\,b\,n\,\mathrm{atanh}\left(\frac{2\,e\,x}{d}+1\right)}{3\,d\,e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e*x)^4,x)
```

```
[Out] - (x^2*(3*a*e^2 + 2*b*e^2*n) + a*d^2 + x*(3*a*d*e + (7*b*d*e*n)/2) + (3*b*d
^2*n)/2)/(3*d^3*e^3 + 3*e^6*x^3 + 9*d^2*e^4*x + 9*d*e^5*x^2) - (log(c*x^n)*
((b*d^2)/(3*e^3) + (b*x^2)/e + (b*d*x)/e^2))/(d^3 + e^3*x^3 + 3*d*e^2*x^2 +
 3*d^2*e*x) - (2*b*n*atanh((2*e*x)/d + 1))/(3*d*e^3)
```

sympy [A] time = 15.67, size = 748, normalized size = 9.47

$$\begin{cases} \tilde{\infty}\left(-\frac{a}{x}-\frac{bn\log(x)}{x}-\frac{bn}{x}-\frac{b\log(c)}{x}\right) \\ \frac{\frac{ax^3}{3}+\frac{bnx^3\log(x)}{3}-\frac{bnx^3}{9}+\frac{bx^3\log(c)}{3}}{d^4} \\ \frac{-\frac{a}{x}-\frac{bn\log(x)}{x}-\frac{bn}{x}-\frac{b\log(c)}{x}}{e^4} \\ -\frac{2ad^3}{6d^4e^3+18d^3e^4x+18d^2e^5x^2+6de^6x^3}-\frac{6ad^2ex}{6d^4e^3+18d^3e^4x+18d^2e^5x^2+6de^6x^3}-\frac{6ade^2x^2}{6d^4e^3+18d^3e^4x+18d^2e^5x^2+6de^6x^3}-\frac{2bd^3n\log\left(\frac{d}{e}+x\right)}{6d^4e^3+18d^3e^4x+18d^2e^5x^2+6de^6x^3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x+d)**4,x)
```

```
[Out] Piecewise((zoo*(-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x), Eq(d, 0) & Eq(e,
 0)), ((a*x**3/3 + b*n*x**3*log(x)/3 - b*n*x**3/9 + b*x**3*log(c)/3)/d**4,
Eq(e, 0)), ((-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x)/e**4, Eq(d, 0)), (-2
*a*d**3/(6*d**4*e**3 + 18*d**3*e**4*x + 18*d**2*e**5*x**2 + 6*d*e**6*x**3)
- 6*a*d**2*e*x/(6*d**4*e**3 + 18*d**3*e**4*x + 18*d**2*e**5*x**2 + 6*d*e**6
*x**3) - 6*a*d*e**2*x**2/(6*d**4*e**3 + 18*d**3*e**4*x + 18*d**2*e**5*x**2
+ 6*d*e**6*x**3) - 2*b*d**3*n*log(d/e + x)/(6*d**4*e**3 + 18*d**3*e**4*x +
18*d**2*e**5*x**2 + 6*d*e**6*x**3) - 3*b*d**3*n/(6*d**4*e**3 + 18*d**3*e**4
*x + 18*d**2*e**5*x**2 + 6*d*e**6*x**3) - 6*b*d**2*e*n*x*log(d/e + x)/(6*d*
*4*e**3 + 18*d**3*e**4*x + 18*d**2*e**5*x**2 + 6*d*e**6*x**3) - 7*b*d**2*e*
n*x/(6*d**4*e**3 + 18*d**3*e**4*x + 18*d**2*e**5*x**2 + 6*d*e**6*x**3) - 6*
b*d*e**2*n*x**2*log(d/e + x)/(6*d**4*e**3 + 18*d**3*e**4*x + 18*d**2*e**5*x
**2 + 6*d*e**6*x**3) - 4*b*d*e**2*n*x**2/(6*d**4*e**3 + 18*d**3*e**4*x + 18
*d**2*e**5*x**2 + 6*d*e**6*x**3) + 2*b*e**3*n*x**3*log(x)/(6*d**4*e**3 + 18
*d**3*e**4*x + 18*d**2*e**5*x**2 + 6*d*e**6*x**3) - 2*b*e**3*n*x**3*log(d/e
 + x)/(6*d**4*e**3 + 18*d**3*e**4*x + 18*d**2*e**5*x**2 + 6*d*e**6*x**3) +
2*b*e**3*x**3*log(c)/(6*d**4*e**3 + 18*d**3*e**4*x + 18*d**2*e**5*x**2 + 6*
d*e**6*x**3), True))
```

3.57 $\int \frac{x(a+b\log(cx^n))}{(d+ex)^4}\,dx$

Optimal. Leaf size=117

$$-\frac{a+b\log(cx^n)}{2e^2(d+ex)^2}+\frac{d\left(a+b\log(cx^n)\right)}{3e^2(d+ex)^3}+\frac{bn\log(x)}{6d^2e^2}-\frac{bn\log(d+ex)}{6d^2e^2}+\frac{bn}{6de^2(d+ex)}-\frac{bn}{6e^2(d+ex)^2}$$

```
[Out] -1/6*b*n/e^2/(e*x+d)^2+1/6*b*n/d/e^2/(e*x+d)+1/6*b*n*ln(x)/d^2/e^2+1/3*d*(a
+b*ln(c*x^n))/e^2/(e*x+d)^3+1/2*(-a-b*ln(c*x^n))/e^2/(e*x+d)^2-1/6*b*n*ln(e
*x+d)/d^2/e^2
```

Rubi [A] time = 0.09, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {43, 2350, 12, 77}

$$-\frac{a+b\log(cx^n)}{2e^2(d+ex)^2}+\frac{d\left(a+b\log(cx^n)\right)}{3e^2(d+ex)^3}+\frac{bn\log(x)}{6d^2e^2}-\frac{bn\log(d+ex)}{6d^2e^2}+\frac{bn}{6de^2(d+ex)}-\frac{bn}{6e^2(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] -(b*n)/(6*e^2*(d + e*x)^2) + (b*n)/(6*d*e^2*(d + e*x)) + (b*n*Log[x])/(6*d^
2*e^2) + (d*(a + b*Log[c*x^n]))/(3*e^2*(d + e*x)^3) - (a + b*Log[c*x^n])/(2
*e^2*(d + e*x)^2) - (b*n*Log[d + e*x])/(6*d^2*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

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

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^4}\,dx = \frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^3} - \frac{a+b\log\left(cx^n\right)}{2e^2(d+ex)^2} - (bn)\int \frac{-d-3ex}{6e^2x(d+ex)^3}\,dx$$
$$= \frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^3} - \frac{a+b\log\left(cx^n\right)}{2e^2(d+ex)^2} - \frac{(bn)\int \frac{-d-3ex}{x(d+ex)^3}\,dx}{6e^2}$$
$$= \frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^3} - \frac{a+b\log\left(cx^n\right)}{2e^2(d+ex)^2} - \frac{(bn)\int \left(-\frac{1}{d^2x} - \frac{2e}{(d+ex)^3} + \frac{e}{d(d+ex)^2} + \frac{e}{d^2(d+ex)}\right)dx}{6e^2}$$
$$= -\frac{bn}{6e^2(d+ex)^2} + \frac{bn}{6de^2(d+ex)} + \frac{bn\log(x)}{6d^2e^2} + \frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^3} - \frac{a+b\log\left(cx^n\right)}{2e^2(d+ex)^2} - b$$

Mathematica [A] time = 0.10, size = 135, normalized size = 1.15

$$-\frac{a+b\log\left(cx^n\right)}{2e^2(d+ex)^2}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^3}-\frac{bn\left(-\frac{2\log(d+ex)}{d^2}+\frac{2\log(x)}{d^2}+\frac{2}{d(d+ex)}+\frac{1}{(d+ex)^2}\right)}{6e^2}+\frac{bn\left(-\frac{\log(d+ex)}{d^2}+\frac{\log(x)}{d^2}+\frac{1}{d(d+e}\right.}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] (d*(a + b*Log[c*x^n]))/(3*e^2*(d + e*x)^3) - (a + b*Log[c*x^n])/(2*e^2*(d +
 e*x)^2) - (b*n*((d + e*x)^(-2) + 2/(d*(d + e*x)) + (2*Log[x])/d^2 - (2*Log
[d + e*x])/d^2))/(6*e^2) + (b*n*(1/(d*(d + e*x)) + Log[x]/d^2 - Log[d + e*x
]/d^2))/(2*e^2)
```

fricas [A] time = 0.64, size = 162, normalized size = 1.38

$$\frac{bde^2nx^2 - ad^3 + \left(bd^2en - 3\,ad^2e\right)x - \left(be^3nx^3 + 3\,bde^2nx^2 + 3\,bd^2enx + bd^3n\right)\log\left(ex+d\right) - \left(3\,bd^2ex + bd^3\right)\log(}{6\left(d^2e^5x^3 + 3\,d^3e^4x^2 + 3\,d^4e^3x + d^5e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="fricas")
```

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

giac [A] time = 0.29, size = 176, normalized size = 1.50

$$-\frac{bnx^3e^3\log\left(xe+d\right) + 3\,bdnx^2e^2\log\left(xe+d\right) + 3\,bd^2nxe\log\left(xe+d\right) - bnx^3e^3\log(x) - 3\,bdnx^2e^2\log(x) - bdnx^2}{6\left(d^2x^3e^5 + 3\,d^3x^2e^4 + 3\,d^4xe^3 + d^5e\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="giac")
```

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

maple [C] time = 0.24, size = 403, normalized size = 3.44

$$-\frac{(3ex+d)\,b\ln\left(x^n\right)}{6\left(ex+d\right)^3e^2}-\frac{-2b\,e^3n\,x^3\ln\left(-x\right)+2b\,e^3n\,x^3\ln\left(ex+d\right)-3i\pi b\,d^2ex\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)+3i\pi b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x+d)^4,x)
```

```
[Out] -1/6*b*(3*e*x+d)/(e*x+d)^3/e^2*ln(x^n)-1/12*(-I*Pi*b*d^3*csgn(I*c)*csgn(I*x
^n)*csgn(I*c*x^n)-3*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3-3*I*Pi*b*d^2*e*x*csgn(I*
c)*csgn(I*x^n)*csgn(I*c*x^n)+3*I*Pi*b*d^2*e*x*csgn(I*c)*csgn(I*c*x^n)^2+I*P
i*b*d^3*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*b*d^3*csgn(I*c*x^n)^3+3*I*Pi*b*d^2*e
*x*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-2*b*e
^3*n*x^3*ln(-x)+2*b*e^3*n*x^3*ln(e*x+d)-6*b*d*e^2*n*x^2*ln(-x)+6*b*d*e^2*n*
x^2*ln(e*x+d)-6*b*d^2*e*n*x*ln(-x)+6*b*d^2*e*n*x*ln(e*x+d)-2*b*d*e^2*n*x^2+
6*b*d^2*e*x*ln(c)-2*b*d^3*n*ln(-x)+2*b*d^3*n*ln(e*x+d)-2*b*d^2*e*n*x+2*b*d^
3*ln(c)+6*a*d^2*e*x+2*a*d^3)/d^2/e^2/(e*x+d)^3
```

maxima [A] time = 0.66, size = 150, normalized size = 1.28

$$\frac{1}{6}bn\left(\frac{x}{de^3x^2+2\,d^2e^2x+d^3e}-\frac{\log\left(ex+d\right)}{d^2e^2}+\frac{\log(x)}{d^2e^2}\right)-\frac{(3\,ex+d)b\log\left(cx^n\right)}{6\left(e^5x^3+3\,de^4x^2+3\,d^2e^3x+d^3e^2\right)}-\frac{(3\,ex}{6\left(e^5x^3+3\,de^4x^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="maxima")
```

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

mupad [B] time = 3.86, size = 141, normalized size = 1.21

$$-\frac{a\,d+x\,\left(3\,a\,e-b\,e\,n\right)-\frac{b\,e^2\,n\,x^2}{d}}{6\,d^3\,e^2+18\,d^2\,e^3\,x+18\,d\,e^4\,x^2+6\,e^5\,x^3}-\frac{\ln\left(c\,x^n\right)\,\left(\frac{b\,d}{6\,e^2}+\frac{b\,x}{2\,e}\right)}{d^3+3\,d^2\,e\,x+3\,d\,e^2\,x^2+e^3\,x^3}-\frac{b\,n\,\mathrm{atanh}\left(\frac{2\,e\,x}{d}+1\right)}{3\,d^2\,e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x)^4,x)
```

```
[Out] - (a*d + x*(3*a*e - b*e*n) - (b*e^2*n*x^2)/d)/(6*d^3*e^2 + 6*e^5*x^3 + 18*d
^2*e^3*x + 18*d*e^4*x^2) - (log(c*x^n)*((b*d)/(6*e^2) + (b*x)/(2*e)))/(d^3
+ e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x) - (b*n*atanh((2*e*x)/d + 1))/(3*d^2*e^
2)
```

sympy [A] time = 15.69, size = 796, normalized size = 6.80

$$\begin{cases} \tilde{\infty}\left(-\frac{a}{2x^2}-\frac{bn\log(x)}{2x^2}-\frac{bn}{4x^2}-\frac{b\log(c)}{2x^2}\right) \\ \frac{-\frac{a}{2x^2}-\frac{bn\log(x)}{2x^2}-\frac{bn}{4x^2}-\frac{b\log(c)}{2x^2}}{e^4} \\ \frac{\frac{ax^2}{2}+\frac{bnx^2\log(x)}{2}-\frac{bnx^2}{4}+\frac{bx^2\log(c)}{2}}{d^4} \\ -\frac{ad^3}{6d^5e^2+18d^4e^3x+18d^3e^4x^2+6d^2e^5x^3}-\frac{3ad^2ex}{6d^5e^2+18d^4e^3x+18d^3e^4x^2+6d^2e^5x^3}-\frac{bd^3n\log\left(\frac{d}{e}+x\right)}{6d^5e^2+18d^4e^3x+18d^3e^4x^2+6d^2e^5x^3}-\frac{3bd^2enx\log\left(\frac{d}{e}\right.}{6d^5e^2+18d^4e^3x+18d^3e^4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x+d)**4,x)
```

```
[Out] Piecewise((zoo*(-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n/(4*x**2) - b*log(c)
/(2*x**2)), Eq(d, 0) & Eq(e, 0)), ((-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n
```

```
/(4*x**2) - b*log(c)/(2*x**2))/e**4, Eq(d, 0)), ((a*x**2/2 + b*n*x**2*log(x
)/2 - b*n*x**2/4 + b*x**2*log(c)/2)/d**4, Eq(e, 0)), (-a*d**3/(6*d**5*e**2
+ 18*d**4*e**3*x + 18*d**3*e**4*x**2 + 6*d**2*e**5*x**3) - 3*a*d**2*e*x/(6*
d**5*e**2 + 18*d**4*e**3*x + 18*d**3*e**4*x**2 + 6*d**2*e**5*x**3) - b*d**3
*n*log(d/e + x)/(6*d**5*e**2 + 18*d**4*e**3*x + 18*d**3*e**4*x**2 + 6*d**2*
e**5*x**3) - 3*b*d**2*e*n*x*log(d/e + x)/(6*d**5*e**2 + 18*d**4*e**3*x + 18
*d**3*e**4*x**2 + 6*d**2*e**5*x**3) + b*d**2*e*n*x/(6*d**5*e**2 + 18*d**4*e
**3*x + 18*d**3*e**4*x**2 + 6*d**2*e**5*x**3) + 3*b*d*e**2*n*x**2*log(x)/(6
*d**5*e**2 + 18*d**4*e**3*x + 18*d**3*e**4*x**2 + 6*d**2*e**5*x**3) - 3*b*d
*e**2*n*x**2*log(d/e + x)/(6*d**5*e**2 + 18*d**4*e**3*x + 18*d**3*e**4*x**2
 + 6*d**2*e**5*x**3) + b*d*e**2*n*x**2/(6*d**5*e**2 + 18*d**4*e**3*x + 18*d
**3*e**4*x**2 + 6*d**2*e**5*x**3) + 3*b*d*e**2*x**2*log(c)/(6*d**5*e**2 + 1
8*d**4*e**3*x + 18*d**3*e**4*x**2 + 6*d**2*e**5*x**3) + b*e**3*n*x**3*log(x
)/(6*d**5*e**2 + 18*d**4*e**3*x + 18*d**3*e**4*x**2 + 6*d**2*e**5*x**3) - b
*e**3*n*x**3*log(d/e + x)/(6*d**5*e**2 + 18*d**4*e**3*x + 18*d**3*e**4*x**2
 + 6*d**2*e**5*x**3) + b*e**3*x**3*log(c)/(6*d**5*e**2 + 18*d**4*e**3*x + 1
8*d**3*e**4*x**2 + 6*d**2*e**5*x**3), True))
```

3.58 $\int \frac{a+b\log(cx^n)}{(d+ex)^4}\,dx$

Optimal. Leaf size=95

$$-\frac{a+b\log\left(cx^n\right)}{3e(d+ex)^3}+\frac{bn\log(x)}{3d^3e}-\frac{bn\log(d+ex)}{3d^3e}+\frac{bn}{3d^2e(d+ex)}+\frac{bn}{6de(d+ex)^2}$$

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

Rubi [A] time = 0.04, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2319, 44}

$$-\frac{a+b\log\left(cx^n\right)}{3e(d+ex)^3}+\frac{bn}{3d^2e(d+ex)}+\frac{bn\log(x)}{3d^3e}-\frac{bn\log(d+ex)}{3d^3e}+\frac{bn}{6de(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x)^4,x]
```

```
[Out] (b*n)/(6*d*e*(d + e*x)^2) + (b*n)/(3*d^2*e*(d + e*x)) + (b*n*Log[x])/(3*d^3
*e) - (a + b*Log[c*x^n])/(3*e*(d + e*x)^3) - (b*n*Log[d + e*x])/(3*d^3*e)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2319

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

Rubi steps

$$\begin{aligned}\int \frac{a+b\log\left(cx^n\right)}{(d+ex)^4}\,dx &= -\frac{a+b\log\left(cx^n\right)}{3e(d+ex)^3}+\frac{(bn)\int \frac{1}{x(d+ex)^3}\,dx}{3e}\\ &= -\frac{a+b\log\left(cx^n\right)}{3e(d+ex)^3}+\frac{(bn)\int \left(\frac{1}{d^3x}-\frac{e}{d(d+ex)^3}-\frac{e}{d^2(d+ex)^2}-\frac{e}{d^3(d+ex)}\right)dx}{3e}\\ &= \frac{bn}{6de(d+ex)^2}+\frac{bn}{3d^2e(d+ex)}+\frac{bn\log(x)}{3d^3e}-\frac{a+b\log\left(cx^n\right)}{3e(d+ex)^3}-\frac{bn\log(d+ex)}{3d^3e}\end{aligned}$$

Mathematica [A] time = 0.09, size = 66, normalized size = 0.69

$$\frac{\frac{bn\left(\frac{d(3d+2ex)}{(d+ex)^2}-2\log(d+ex)+2\log(x)\right)}{2d^3}-\frac{a+b\log(cx^n)}{(d+ex)^3}}{3e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x)^4,x]
```

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

fricas [A] time = 0.77, size = 160, normalized size = 1.68

$$\frac{2\,bde^2nx^2 + 5\,bd^2enx + 3\,bd^3n - 2\,bd^3\log(c) - 2\,ad^3 - 2\left(be^3nx^3 + 3\,bde^2nx^2 + 3\,bd^2enx + bd^3n\right)\log\left(ex + d\right) + 2}{6\left(d^3e^4x^3 + 3\,d^4e^3x^2 + 3\,d^5e^2x + d^6e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="fricas")
```

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

giac [B] time = 0.30, size = 179, normalized size = 1.88

$$-\frac{2\,bnx^3e^3\log\left(xe + d\right) + 6\,bdnx^2e^2\log\left(xe + d\right) + 6\,bd^2nxe\log\left(xe + d\right) - 2\,bnx^3e^3\log(x) - 6\,bdnx^2e^2\log(x) - 6\,b}{6\left(d^3x^3e^4 + 3\,d^4x^2e^3 + 3\,d^5xe^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="giac")
```

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

maple [C] time = 0.20, size = 284, normalized size = 2.99

$$-\frac{b\ln\left(x^n\right)}{3\left(ex + d\right)^3 e} - \frac{-2b\,e^3n\,x^3\ln\left(-x\right) + 2b\,e^3n\,x^3\ln\left(ex + d\right) - 6bd\,e^2n\,x^2\ln\left(-x\right) + 6bd\,e^2n\,x^2\ln\left(ex + d\right) - i\pi b\,d^3\mathrm{csgn}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x+d)^4,x)
```

```
[Out] -1/3*b/e/(e*x+d)^3*ln(x^n)-1/6*(I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi
*b*d^3*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*b*d^3*csgn(I*c)*csgn(I*x^n)*csgn(I*c*
x^n)-I*Pi*b*d^3*csgn(I*c*x^n)^3+2*b*e^3*n*x^3*ln(e*x+d)-2*b*e^3*n*x^3*ln(-x
)+6*b*d*e^2*n*x^2*ln(e*x+d)-6*b*d*e^2*n*x^2*ln(-x)+6*b*d^2*e*n*x*ln(e*x+d)-
6*b*d^2*e*n*x*ln(-x)-2*b*d*e^2*n*x^2+2*b*d^3*n*ln(e*x+d)-2*b*d^3*n*ln(-x)-5
*b*d^2*e*n*x+2*b*d^3*ln(c)-3*b*d^3*n+2*a*d^3)/d^3/e/(e*x+d)^3
```

maxima [A] time = 0.58, size = 144, normalized size = 1.52

$$\frac{1}{6}\,bn\left(\frac{2\,ex + 3\,d}{d^2e^3x^2 + 2\,d^3e^2x + d^4e} - \frac{2\,\log\left(ex + d\right)}{d^3e} + \frac{2\,\log(x)}{d^3e}\right) - \frac{b\log\left(cx^n\right)}{3\left(e^4x^3 + 3\,de^3x^2 + 3\,d^2e^2x + d^3e\right)} - \frac{a}{3\left(e^4x^3 + 3\,de^3x^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="maxima")
```

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

mupad [B] time = 3.85, size = 127, normalized size = 1.34

$$\frac{\frac{3bn}{2}-a+\frac{be^2nx^2}{d^2}+\frac{5benx}{2d}}{3d^3e+9d^2e^2x+9de^3x^2+3e^4x^3}-\frac{b\ln\left(cx^n\right)}{3e\left(d^3+3d^2ex+3de^2x^2+e^3x^3\right)}-\frac{2bn\,\mathrm{atanh}\left(\frac{2ex}{d}+1\right)}{3d^3e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x)^4,x)
```

```
[Out] ((3*b*n)/2 - a + (b*e^2*n*x^2)/d^2 + (5*b*e*n*x)/(2*d))/(3*d^3*e + 3*e^4*x^
3 + 9*d^2*e^2*x + 9*d*e^3*x^2) - (b*log(c*x^n))/(3*e*(d^3 + e^3*x^3 + 3*d*e
^2*x^2 + 3*d^2*e*x)) - (2*b*n*atanh((2*e*x)/d + 1))/(3*d^3*e)
```

sympy [A] time = 16.08, size = 882, normalized size = 9.28

$$\begin{cases} \tilde{\infty}\left(-\frac{a}{3x^3}-\frac{bn\log(x)}{3x^3}-\frac{bn}{9x^3}-\frac{b\log(c)}{3x^3}\right) \\ \frac{-\frac{a}{3x^3}-\frac{bn\log(x)}{3x^3}-\frac{bn}{9x^3}-\frac{b\log(c)}{3x^3}}{e^4} \\ \frac{ax+bnx\log(x)-bnx+bx\log(c)}{d^4} \\ -\frac{2ad^3}{6d^6e+18d^5e^2x+18d^4e^3x^2+6d^3e^4x^3}-\frac{2bd^3n\log\left(\frac{d}{e}+x\right)}{6d^6e+18d^5e^2x+18d^4e^3x^2+6d^3e^4x^3}+\frac{3bd^3n}{6d^6e+18d^5e^2x+18d^4e^3x^2+6d^3e^4x^3}+\frac{6bd^2enx\log(x)}{6d^6e+18d^5e^2x+18d^4e^3x^2+} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x+d)**4,x)
```

```
[Out] Piecewise((zoo*(-a/(3*x**3) - b*n*log(x)/(3*x**3) - b*n/(9*x**3) - b*log(c)
/(3*x**3)), Eq(d, 0) & Eq(e, 0)), ((-a/(3*x**3) - b*n*log(x)/(3*x**3) - b*n
/(9*x**3) - b*log(c)/(3*x**3))/e**4, Eq(d, 0)), ((a*x + b*n*x*log(x) - b*n*
x + b*x*log(c))/d**4, Eq(e, 0)), (-2*a*d**3/(6*d**6*e + 18*d**5*e**2*x + 18
*d**4*e**3*x**2 + 6*d**3*e**4*x**3) - 2*b*d**3*n*log(d/e + x)/(6*d**6*e + 1
8*d**5*e**2*x + 18*d**4*e**3*x**2 + 6*d**3*e**4*x**3) + 3*b*d**3*n/(6*d**6*
e + 18*d**5*e**2*x + 18*d**4*e**3*x**2 + 6*d**3*e**4*x**3) + 6*b*d**2*e*n*x
*log(x)/(6*d**6*e + 18*d**5*e**2*x + 18*d**4*e**3*x**2 + 6*d**3*e**4*x**3)
- 6*b*d**2*e*n*x*log(d/e + x)/(6*d**6*e + 18*d**5*e**2*x + 18*d**4*e**3*x**
2 + 6*d**3*e**4*x**3) + 5*b*d**2*e*n*x/(6*d**6*e + 18*d**5*e**2*x + 18*d**4
*e**3*x**2 + 6*d**3*e**4*x**3) + 6*b*d**2*e*x*log(c)/(6*d**6*e + 18*d**5*e*
*2*x + 18*d**4*e**3*x**2 + 6*d**3*e**4*x**3) + 6*b*d*e**2*n*x**2*log(x)/(6*
d**6*e + 18*d**5*e**2*x + 18*d**4*e**3*x**2 + 6*d**3*e**4*x**3) - 6*b*d*e**
2*n*x**2*log(d/e + x)/(6*d**6*e + 18*d**5*e**2*x + 18*d**4*e**3*x**2 + 6*d*
*3*e**4*x**3) + 2*b*d*e**2*n*x**2/(6*d**6*e + 18*d**5*e**2*x + 18*d**4*e**3
*x**2 + 6*d**3*e**4*x**3) + 6*b*d*e**2*x**2*log(c)/(6*d**6*e + 18*d**5*e**2
*x + 18*d**4*e**3*x**2 + 6*d**3*e**4*x**3) + 2*b*e**3*n*x**3*log(x)/(6*d**6
*e + 18*d**5*e**2*x + 18*d**4*e**3*x**2 + 6*d**3*e**4*x**3) - 2*b*e**3*n*x*
*3*log(d/e + x)/(6*d**6*e + 18*d**5*e**2*x + 18*d**4*e**3*x**2 + 6*d**3*e**
4*x**3) + 2*b*e**3*x**3*log(c)/(6*d**6*e + 18*d**5*e**2*x + 18*d**4*e**3*x*
*2 + 6*d**3*e**4*x**3), True))
```

3.59 $\int \frac{a+b\log(cx^n)}{x(d+ex)^4}\,dx$

Optimal. Leaf size=174

$$-\frac{\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{ex\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)}+\frac{a+b\log\left(cx^n\right)}{2d^2(d+ex)^2}+\frac{a+b\log\left(cx^n\right)}{3d(d+ex)^3}+\frac{bn\text{Li}_2\left(-\frac{d}{ex}\right)}{d^4}+\frac{11bn\log(d}{6d^4}$$

```
[Out] -1/6*b*n/d^2/(e*x+d)^2-5/6*b*n/d^3/(e*x+d)-5/6*b*n*ln(x)/d^4+1/3*(a+b*ln(c*
x^n))/d/(e*x+d)^3+1/2*(a+b*ln(c*x^n))/d^2/(e*x+d)^2-e*x*(a+b*ln(c*x^n))/d^4
/(e*x+d)-ln(1+d/e/x)*(a+b*ln(c*x^n))/d^4+11/6*b*n*ln(e*x+d)/d^4+b*n*polylog
(2,-d/e/x)/d^4
```

Rubi [A] time = 0.36, antiderivative size = 196, normalized size of antiderivative = 1.13, number of steps used = 15, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {2347, 2344, 2301, 2317, 2391, 2314, 31, 2319, 44}

$$-\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}-\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{ex\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)}+\frac{a+b\log\left(cx^n\right)}{2d^2(d+ex)^2}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2bd^4n}+\frac{a}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x)^4),x]
```

```
[Out] -(b*n)/(6*d^2*(d + e*x)^2) - (5*b*n)/(6*d^3*(d + e*x)) - (5*b*n*Log[x])/(6*
d^4) + (a + b*Log[c*x^n])/(3*d*(d + e*x)^3) + (a + b*Log[c*x^n])/(2*d^2*(d
+ e*x)^2) - (e*x*(a + b*Log[c*x^n]))/(d^4*(d + e*x)) + (a + b*Log[c*x^n])^2
/(2*b*d^4*n) + (11*b*n*Log[d + e*x])/(6*d^4) - ((a + b*Log[c*x^n])*Log[1 +
(e*x)/d])/d^4 - (b*n*PolyLog[2, -((e*x)/d)])/d^4
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2319

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

Rule 2344

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

Rule 2347

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

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex)^4}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^3}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^4}\,dx}{d}$$

$$= \frac{a+b\log(cx^n)}{3d(d+ex)^3} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{d^2} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{d^2} - \frac{(bn)\int \frac{1}{x(d+ex)^3}\,dx}{3d}$$

$$= \frac{a+b\log(cx^n)}{3d(d+ex)^3} + \frac{a+b\log(cx^n)}{2d^2(d+ex)^2} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx}{d^3} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^3} - \frac{(bn)\int \frac{1}{x(d+ex}}{2d^2}$$

$$= -\frac{bn}{6d^2(d+ex)^2} - \frac{bn}{3d^3(d+ex)} - \frac{bn\log(x)}{3d^4} + \frac{a+b\log(cx^n)}{3d(d+ex)^3} + \frac{a+b\log(cx^n)}{2d^2(d+ex)^2} - \frac{ex\left(a+\right.}{d^4}$$

$$= -\frac{bn}{6d^2(d+ex)^2} - \frac{5bn}{6d^3(d+ex)} - \frac{5bn\log(x)}{6d^4} + \frac{a+b\log(cx^n)}{3d(d+ex)^3} + \frac{a+b\log(cx^n)}{2d^2(d+ex)^2} - \frac{ex\left(a\right.}{d}$$

$$= -\frac{bn}{6d^2(d+ex)^2} - \frac{5bn}{6d^3(d+ex)} - \frac{5bn\log(x)}{6d^4} + \frac{a+b\log(cx^n)}{3d(d+ex)^3} + \frac{a+b\log(cx^n)}{2d^2(d+ex)^2} - \frac{ex\left(a\right.}{d}$$

Mathematica [A] time = 0.18, size = 222, normalized size = 1.28

$$\frac{\frac{3a^2}{bn} + \frac{6a\log(cx^n)}{n} + \frac{2ad^3}{(d+ex)^3} + \frac{3ad^2}{(d+ex)^2} + \frac{6ad}{d+ex} - 6a\log\left(\frac{ex}{d}+1\right) + \frac{2bd^3\log(cx^n)}{(d+ex)^3} + \frac{3bd^2\log(cx^n)}{(d+ex)^2} + \frac{6bd\log(cx^n)}{d+ex} - 6b\log(cx^{\cdots}}{6d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x)^4),x]
```

```
[Out] ((3*a^2)/(b*n) + (2*a*d^3)/(d + e*x)^3 + (3*a*d^2)/(d + e*x)^2 - (b*d^2*n)/
(d + e*x)^2 + (6*a*d)/(d + e*x) - (5*b*d*n)/(d + e*x) - 11*b*n*Log[x] + (6*
a*Log[c*x^n])/n + (2*b*d^3*Log[c*x^n])/(d + e*x)^3 + (3*b*d^2*Log[c*x^n])/(
d + e*x)^2 + (6*b*d*Log[c*x^n])/(d + e*x) + (3*b*Log[c*x^n]^2)/n + 11*b*n*L
og[d + e*x] - 6*a*Log[1 + (e*x)/d] - 6*b*Log[c*x^n]*Log[1 + (e*x)/d] - 6*b*
n*PolyLog[2, -((e*x)/d)])/(6*d^4)
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{4}x^{5}+4\,de^{3}x^{4}+6\,d^{2}e^{2}x^{3}+4\,d^{3}ex^{2}+d^{4}x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^4*x^5 + 4*d*e^3*x^4 + 6*d^2*e^2*x^3 + 4*d^3*
e*x^2 + d^4*x), x)
```

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

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex+d\right)^{4}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^4*x), x)
```

maple [C] time = 0.20, size = 884, normalized size = 5.08

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x+d)^4,x)
```

```
[Out] b*n/d^4*ln(e*x+d)*ln(-1/d*e*x)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)/d^2/(e*x+d)^2-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/(e*x+d)^3
-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*ln(x)+1/6*I*b*Pi*csgn(I
*x^n)*csgn(I*c*x^n)^2/d/(e*x+d)^3+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*
ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^4*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d
^4*ln(x)-1/6*I*b*Pi*csgn(I*c*x^n)^3/d/(e*x+d)^3-1/4*I*b*Pi*csgn(I*c*x^n)^3/
d^2/(e*x+d)^2-1/2*b*n/d^4*ln(x)^2+b*n/d^4*dilog(-1/d*e*x)-a/d^4*ln(e*x+d)+a
/d^3/(e*x+d)+1/2*a/d^2/(e*x+d)^2+1/3*a/d/(e*x+d)^3+a/d^4*ln(x)+1/2*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*ln(e*x+d)+b*ln(c)/d^3/(e*x+d)+1/2*b*
ln(c)/d^2/(e*x+d)^2+1/3*b*ln(c)/d/(e*x+d)^3+b*ln(c)/d^4*ln(x)-b*ln(c)/d^4*l
n(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3/(e*x+d)+b*ln(x^n)/d^4*ln(x)-b*ln(x^
n)/d^4*ln(e*x+d)+b*ln(x^n)/d^3/(e*x+d)+1/2*b*ln(x^n)/d^2/(e*x+d)^2+1/3*b*ln
(x^n)/d/(e*x+d)^3-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3/(e*x+d
)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)^2/d^4*ln(x)+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(e*x+d)
^3-1/6*b*n/d^2/(e*x+d)^2-5/6*b*n/d^3/(e*x+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)^2/d^2/(e*x+d)^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3/(e*x+d)-1
/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^
2*csgn(I*c)/d^3/(e*x+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/(e*x+d)^2-
11/6*b*n*ln(x)/d^4+11/6*b*n*ln(e*x+d)/d^4
```

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

$$\frac{1}{6}\,a\left(\frac{6\,e^{2}x^{2}+15\,dex+11\,d^{2}}{d^{3}e^{3}x^{3}+3\,d^{4}e^{2}x^{2}+3\,d^{5}ex+d^{6}}-\frac{6\,\log\left(ex+d\right)}{d^{4}}+\frac{6\,\log(x)}{d^{4}}\right)+b\int\frac{\log(c)+\log\left(x^{n}\right)}{e^{4}x^{5}+4\,de^{3}x^{4}+6\,d^{2}e^{2}x^{3}+4\,d^{3}ex^{2}+d^{4}x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/6*a*((6*e^2*x^2 + 15*d*e*x + 11*d^2)/(d^3*e^3*x^3 + 3*d^4*e^2*x^2 + 3*d^5
*e*x + d^6) - 6*log(e*x + d)/d^4 + 6*log(x)/d^4) + b*integrate((log(c) + lo
g(x^n))/(e^4*x^5 + 4*d*e^3*x^4 + 6*d^2*e^2*x^3 + 4*d^3*e*x^2 + d^4*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x\,{\left(d+e\,x\right)}^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x)^4),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x)^4), x)
```

sympy [A] time = 147.34, size = 493, normalized size = 2.83

$$-\frac{ae\left(\begin{cases}\frac{x}{d^4} & \text{for}\ e=0\\ -\frac{1}{3e(d+ex)^3} & \text{otherwise}\end{cases}\right)}{d}-\frac{ae\left(\begin{cases}\frac{x}{d^3} & \text{for}\ e=0\\ -\frac{1}{2e(d+ex)^2} & \text{otherwise}\end{cases}\right)}{d^2}-\frac{ae\left(\begin{cases}\frac{x}{d^2} & \text{for}\ e=0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{d^3}-\frac{ae\left(\begin{cases}\frac{x}{d} & \text{f}\\ \frac{\log(d+ex)}{e} & \text{o}\end{cases}\right)}{d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x+d)**4,x)
```

```
[Out] -a*e*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))/d - a*e*P
iecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/d**2 - a*e*Piec
ewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/d**3 - a*e*Piecewise((
x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d**4 + a*log(x)/d**4 - b*e**3*n*Pie
cewise((-1/(e**4*x), Eq(d, 0)), (-3*d/(6*d**2*e**3 + 12*d*e**4*x + 6*e**5*x
**2) - 4*e*x/(6*d**2*e**3 + 12*d*e**4*x + 6*e**5*x**2) - log(d + e*x)/(3*d*
e**3), True))/d**3 + b*e**3*Piecewise((1/(e**4*x), Eq(d, 0)), (-1/(3*d*(d/x
 + e)**3), True))*log(c*x**n)/d**3 + 3*b*e**2*n*Piecewise((-1/(e**3*x), Eq(
d, 0)), (-1/(2*d*e**2 + 2*e**3*x) - log(d + e*x)/(2*d*e**2), True))/d**3 -
3*b*e**2*Piecewise((1/(e**3*x), Eq(d, 0)), (-1/(2*d*(d/x + e)**2), True))*l
og(c*x**n)/d**3 - 3*b*e*n*Piecewise((-1/(e**2*x), Eq(d, 0)), (-log(d**2 + d
*e*x)/(d*e), True))/d**3 + 3*b*e*Piecewise((1/(e**2*x), Eq(d, 0)), (-1/(d**
2/x + d*e), True))*log(c*x**n)/d**3 + b*n*Piecewise((-1/(e*x), Eq(d, 0)), (
Piecewise((log(e)*log(x) + polylog(2, d*exp_polar(I*pi)/(e*x)), Abs(x) < 1)
, (-log(e)*log(1/x) + polylog(2, d*exp_polar(I*pi)/(e*x)), 1/Abs(x) < 1), (
-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((),
 (0, 0)), x)*log(e) + polylog(2, d*exp_polar(I*pi)/(e*x)), True))/d, True))
/d**3 - b*Piecewise((1/(e*x), Eq(d, 0)), (log(d/x + e)/d, True))*log(c*x**n
)/d**3
```

3.60 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)^4}\,dx$

Optimal. Leaf size=211

$$\frac{3e^2x\left(a+b\log\left(cx^n\right)\right)}{d^5(d+ex)}+\frac{4e\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^5}-\frac{a+b\log\left(cx^n\right)}{d^4x}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{3d^2(d+ex)^3}-$$

```
[Out] -b*n/d^4/x+1/6*b*e*n/d^3/(e*x+d)^2+4/3*b*e*n/d^4/(e*x+d)+4/3*b*e*n*ln(x)/d^
5+(-a-b*ln(c*x^n))/d^4/x-1/3*e*(a+b*ln(c*x^n))/d^2/(e*x+d)^3-e*(a+b*ln(c*x^
n))/d^3/(e*x+d)^2+3*e^2*x*(a+b*ln(c*x^n))/d^5/(e*x+d)+4*e*ln(1+d/e/x)*(a+b*
ln(c*x^n))/d^5-13/3*b*e*n*ln(e*x+d)/d^5-4*b*e*n*polylog(2,-d/e/x)/d^5
```

Rubi [A] time = 0.30, antiderivative size = 231, normalized size of antiderivative = 1.09, number of steps used = 14, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = $\{44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391\}$

$$\frac{4ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^5}+\frac{3e^2x\left(a+b\log\left(cx^n\right)\right)}{d^5(d+ex)}-\frac{2e\left(a+b\log\left(cx^n\right)\right)^2}{bd^5n}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{3d^2(d+ex)^3}+\frac{4e}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x)^4),x]
```

```
[Out] -((b*n)/(d^4*x)) + (b*e*n)/(6*d^3*(d + e*x)^2) + (4*b*e*n)/(3*d^4*(d + e*x)
) + (4*b*e*n*Log[x])/(3*d^5) - (a + b*Log[c*x^n])/(d^4*x) - (e*(a + b*Log[c
*x^n]))/(3*d^2*(d + e*x)^3) - (e*(a + b*Log[c*x^n]))/(d^3*(d + e*x)^2) + (3
*e^2*x*(a + b*Log[c*x^n]))/(d^5*(d + e*x)) - (2*e*(a + b*Log[c*x^n])^2)/(b*
d^5*n) - (13*b*e*n*Log[d + e*x])/(3*d^5) + (4*e*(a + b*Log[c*x^n])*Log[1 +
(e*x)/d])/d^5 + (4*b*e*n*PolyLog[2, -((e*x)/d)])/d^5
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
```

```
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex)^4}\,dx = \int\left(\frac{a+b\log(cx^n)}{d^4x^2} - \frac{4e\left(a+b\log(cx^n)\right)}{d^5x} + \frac{e^2\left(a+b\log(cx^n)\right)}{d^2(d+ex)^4} + \frac{2e^2\left(a+b\log(cx^n)\right)}{d^3(d+ex)^3}\right.$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^4} - \frac{(4e)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^5} + \frac{\left(4e^2\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^5} + \frac{\left(3e^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^4}$$

$$= -\frac{bn}{d^4x} - \frac{a+b\log(cx^n)}{d^4x} - \frac{e\left(a+b\log(cx^n)\right)}{3d^2(d+ex)^3} - \frac{e\left(a+b\log(cx^n)\right)}{d^3(d+ex)^2} + \frac{3e^2x\left(a+b\log(c\right.}{d^5(d+ex)}$$

$$= -\frac{bn}{d^4x} - \frac{a+b\log(cx^n)}{d^4x} - \frac{e\left(a+b\log(cx^n)\right)}{3d^2(d+ex)^3} - \frac{e\left(a+b\log(cx^n)\right)}{d^3(d+ex)^2} + \frac{3e^2x\left(a+b\log(c\right.}{d^5(d+ex)}$$

$$= -\frac{bn}{d^4x} + \frac{ben}{6d^3(d+ex)^2} + \frac{4ben}{3d^4(d+ex)} + \frac{4ben\log(x)}{3d^5} - \frac{a+b\log(cx^n)}{d^4x} - \frac{e\left(a+b\log(c\right.}{3d^2(d+ex)^3}$$

Mathematica [A] time = 0.28, size = 231, normalized size = 1.09

$$\frac{-\frac{2d^3e\left(a+b\log(cx^n)\right)}{(d+ex)^3} - \frac{6d^2e\left(a+b\log(cx^n)\right)}{(d+ex)^2} - \frac{18de\left(a+b\log(cx^n)\right)}{d+ex} + 24e\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right) - \frac{6d\left(a+b\log(cx^n)\right)}{x} - \frac{12e(a\ldots}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x)^4),x]
```

```
[Out] ((-6*b*d*n)/x - (6*d*(a + b*Log[c*x^n]))/x - (2*d^3*e*(a + b*Log[c*x^n]))/(
d + e*x)^3 - (6*d^2*e*(a + b*Log[c*x^n]))/(d + e*x)^2 - (18*d*e*(a + b*Log[
c*x^n]))/(d + e*x) - (12*e*(a + b*Log[c*x^n])^2)/(b*n) + b*e*n*((d*(3*d + 2
*e*x))/(d + e*x)^2 + 2*Log[x] - 2*Log[d + e*x]) + 18*b*e*n*(Log[x] - Log[d
+ e*x]) + 6*b*e*n*(d/(d + e*x) + Log[x] - Log[d + e*x]) + 24*e*(a + b*Log[c
*x^n])*Log[1 + (e*x)/d] + 24*b*e*n*PolyLog[2, -((e*x)/d)])/(6*d^5)
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^4x^6+4\,de^3x^5+6\,d^2e^2x^4+4\,d^3ex^3+d^4x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^4*x^6 + 4*d*e^3*x^5 + 6*d^2*e^2*x^4 + 4*d^3*
e*x^3 + d^4*x^2), x)
```

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

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex+d\right)^4x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^4*x^2), x)
```

maple [C] time = 0.21, size = 1083, normalized size = 5.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(e*x+d)^4,x)
```

```
[Out] 2*b*n/d^5*e*ln(x)^2-4*b*n/d^5*e*dilog(-1/d*e*x)-1/2*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)^2/d^3*e/(e*x+d)^2+2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^5*e*ln(e*x
+d)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^4/x-4*b*n/d^5*e*ln(e*x+d)*ln(-1/d*e*x)-4*a
/d^5*e*ln(x)+4*a/d^5*e*ln(e*x+d)-1/3*a*e/d^2/(e*x+d)^3-3*a*e/d^4/(e*x+d)-a/
d^3*e/(e*x+d)^2-b*ln(c)/d^4/x-b*ln(x^n)/d^4/x-2*I*b*Pi*csgn(I*c*x^n)^2*csgn
(I*c)/d^5*e*ln(x)+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/(e*x
+d)^3-2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^5*e*ln(e*x+d)+3/2*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^4/(e*x+d)-a/d^4/x-1/6*I*b*Pi*csg
n(I*c*x^n)^2*csgn(I*c)*e/d^2/(e*x+d)^3+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)/d^4/x+2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^5*e*ln(x)+1
/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e/(e*x+d)^2-1/3*b*ln(c)*e
/d^2/(e*x+d)^3-4*b*ln(c)/d^5*e*ln(x)+4*b*ln(c)/d^5*e*ln(e*x+d)-3*b*ln(c)*e/
d^4/(e*x+d)-b*ln(c)/d^3*e/(e*x+d)^2-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*
e/d^4/(e*x+d)-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2/(e*x+d)^3-1/2*I*
b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*e/(e*x+d)^2-2*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)^2/d^5*e*ln(x)-3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^4/(e*x+d)+2*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^5*e*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^
3/d^3*e/(e*x+d)^2-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4/x-1/2*I*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2/d^4/x-1/3*b*ln(x^n)*e/d^2/(e*x+d)^3+4*b*ln(x^n)/d^
5*e*ln(e*x+d)-3*b*ln(x^n)*e/d^4/(e*x+d)-4*b*ln(x^n)/d^5*e*ln(x)-b*ln(x^n)/d
^3*e/(e*x+d)^2+2*I*b*Pi*csgn(I*c*x^n)^3/d^5*e*ln(x)+1/6*b*e*n/d^3/(e*x+d)^2
+4/3*b*e*n/d^4/(e*x+d)-b*n/d^4/x+1/6*I*b*Pi*csgn(I*c*x^n)^3*e/d^2/(e*x+d)^3
-2*I*b*Pi*csgn(I*c*x^n)^3/d^5*e*ln(e*x+d)+3/2*I*b*Pi*csgn(I*c*x^n)^3*e/d^4/
(e*x+d)+13/3*b*e*n*ln(x)/d^5-13/3*b*e*n*ln(e*x+d)/d^5
```

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

$$-\frac{1}{3}a\left(\frac{12e^3x^3+30de^2x^2+22d^2ex+3d^3}{d^4e^3x^4+3d^5e^2x^3+3d^6ex^2+d^7x}-\frac{12e\log(ex+d)}{d^5}+\frac{12e\log(x)}{d^5}\right)+b\int\frac{\log(c)+\log(x^{n})}{e^4x^6+4de^3x^5+6d^2e^2x^4+\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] -1/3*a*((12*e^3*x^3 + 30*d*e^2*x^2 + 22*d^2*e*x + 3*d^3)/(d^4*e^3*x^4 + 3*d
^5*e^2*x^3 + 3*d^6*e*x^2 + d^7*x) - 12*e*log(e*x + d)/d^5 + 12*e*log(x)/d^5
) + b*integrate((log(c) + log(x^n))/(e^4*x^6 + 4*d*e^3*x^5 + 6*d^2*e^2*x^4
+ 4*d^3*e*x^3 + d^4*x^2), x)
```

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

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^2\,{\left(d+e\,x\right)}^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x)^4),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x)^4), x)
```

sympy [A] time = 141.37, size = 595, normalized size = 2.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x+d)**4,x)
```

```
[Out] a*e**2*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))/d**2 +
2*a*e**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/d**3
+ 3*a*e**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/d**4 -
a/(d**4*x) + 4*a*e**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d*
*5 - 4*a*e*log(x)/d**5 - b*e**2*n*Piecewise((x/d**4, Eq(e, 0)), (-3*d/(6*d*
*4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2) - 2*e*x/(6*d**4*e + 12*d**3*e**2*
x + 6*d**2*e**3*x**2) - log(x)/(3*d**3*e) + log(d/e + x)/(3*d**3*e), True))
/d**2 + b*e**2*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))
*log(c*x**n)/d**2 - 2*b*e**2*n*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2*e
+ 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/e + x)/(2*d**2*e), True))/d**3 +
2*b*e**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*log(c
*x**n)/d**3 - 3*b*e**2*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) + log
(d/e + x)/(d*e), True))/d**4 + 3*b*e**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(
d*e + e**2*x), True))*log(c*x**n)/d**4 - b*n/(d**4*x) - b*log(c*x**n)/(d**4
*x) - 4*b*e**2*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - pol
ylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2,
 e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()
), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e
*x*exp_polar(I*pi)/d), True))/e, True))/d**5 + 4*b*e**2*Piecewise((x/d, Eq(
e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/d**5 + 2*b*e*n*log(x)**2/d**5 -
 4*b*e*log(x)*log(c*x**n)/d**5
```

3.61 $\int \frac{a+b\log(cx^n)}{x^3(d+ex)^4}\,dx$

Optimal. Leaf size=263

$$-\frac{6e^3x\left(a+b\log\left(cx^n\right)\right)}{d^6(d+ex)}-\frac{10e^2\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^6}+\frac{4e\left(a+b\log\left(cx^n\right)\right)}{d^5x}+\frac{3e^2\left(a+b\log\left(cx^n\right)\right)}{2d^4(d+ex)^2}-\frac{a+b\log}{2d^4x}$$

```
[Out] -1/4*b*n/d^4/x^2+4*b*e*n/d^5/x-1/6*b*e^2*n/d^4/(e*x+d)^2-11/6*b*e^2*n/d^5/(
e*x+d)-11/6*b*e^2*n*ln(x)/d^6+1/2*(-a-b*ln(c*x^n))/d^4/x^2+4*e*(a+b*ln(c*x^
n))/d^5/x+1/3*e^2*(a+b*ln(c*x^n))/d^3/(e*x+d)^3+3/2*e^2*(a+b*ln(c*x^n))/d^4
/(e*x+d)^2-6*e^3*x*(a+b*ln(c*x^n))/d^6/(e*x+d)-10*e^2*ln(1+d/e/x)*(a+b*ln(c
*x^n))/d^6+47/6*b*e^2*n*ln(e*x+d)/d^6+10*b*e^2*n*polylog(2,-d/e/x)/d^6
```

Rubi [A] time = 0.35, antiderivative size = 285, normalized size of antiderivative = 1.08, number of steps used = 15, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391}

$$-\frac{10be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^6}-\frac{6e^3x\left(a+b\log\left(cx^n\right)\right)}{d^6(d+ex)}+\frac{5e^2\left(a+b\log\left(cx^n\right)\right)^2}{bd^6n}+\frac{3e^2\left(a+b\log\left(cx^n\right)\right)}{2d^4(d+ex)^2}+\frac{e^2\left(a+b\log\left(cx\right.\right.}{3d^3(d+ex)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x)^4),x]
```

```
[Out] -(b*n)/(4*d^4*x^2) + (4*b*e*n)/(d^5*x) - (b*e^2*n)/(6*d^4*(d + e*x)^2) - (1
1*b*e^2*n)/(6*d^5*(d + e*x)) - (11*b*e^2*n*Log[x])/(6*d^6) - (a + b*Log[c*x
^n])/(2*d^4*x^2) + (4*e*(a + b*Log[c*x^n]))/(d^5*x) + (e^2*(a + b*Log[c*x^n
]))/(3*d^3*(d + e*x)^3) + (3*e^2*(a + b*Log[c*x^n]))/(2*d^4*(d + e*x)^2) -
(6*e^3*x*(a + b*Log[c*x^n]))/(d^6*(d + e*x)) + (5*e^2*(a + b*Log[c*x^n])^2)
/(b*d^6*n) + (47*b*e^2*n*Log[d + e*x])/(6*d^6) - (10*e^2*(a + b*Log[c*x^n])
*Log[1 + (e*x)/d])/d^6 - (10*b*e^2*n*PolyLog[2, -((e*x)/d)])/d^6
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
```

```
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex)^4}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^4x^3} - \frac{4e\left(a+b\log(cx^n)\right)}{d^5x^2} + \frac{10e^2\left(a+b\log(cx^n)\right)}{d^6x} - \frac{e^3\left(a+b\log(cx^n)\right)}{d^3(d+ex)^4}\right.$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d^4} - \frac{(4e)\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^5} + \frac{\left(10e^2\right)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^6} - \frac{\left(10e^3\right)\int \frac{a+b\log(cx^n)}{d+ex}\,d}{d^6}$$

$$= -\frac{bn}{4d^4x^2} + \frac{4ben}{d^5x} - \frac{a+b\log(cx^n)}{2d^4x^2} + \frac{4e\left(a+b\log(cx^n)\right)}{d^5x} + \frac{e^2\left(a+b\log(cx^n)\right)}{3d^3(d+ex)^3} + \frac{3e^2(}{2}$$

$$= -\frac{bn}{4d^4x^2} + \frac{4ben}{d^5x} - \frac{a+b\log(cx^n)}{2d^4x^2} + \frac{4e\left(a+b\log(cx^n)\right)}{d^5x} + \frac{e^2\left(a+b\log(cx^n)\right)}{3d^3(d+ex)^3} + \frac{3e^2(}{2}$$

$$= -\frac{bn}{4d^4x^2} + \frac{4ben}{d^5x} - \frac{be^2n}{6d^4(d+ex)^2} - \frac{11be^2n}{6d^5(d+ex)} - \frac{11be^2n\log(x)}{6d^6} - \frac{a+b\log(cx^n)}{2d^4x^2} + \frac{4e}{}$$

Mathematica [A] time = 0.38, size = 276, normalized size = 1.05

$$\frac{\frac{4d^3e^2\left(a+b\log(cx^n)\right)}{(d+ex)^3} + \frac{18d^2e^2\left(a+b\log(cx^n)\right)}{(d+ex)^2} - \frac{6d^2\left(a+b\log(cx^n)\right)}{x^2} + \frac{72de^2\left(a+b\log(cx^n)\right)}{d+ex} - 120e^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right) +}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x)^4),x]
```

```
[Out] ((-3*b*d^2*n)/x^2 + (48*b*d*e*n)/x - (18*b*d*e^2*n)/(d + e*x) - (2*b*d*e^2*
n*(3*d + 2*e*x))/(d + e*x)^2 - 22*b*e^2*n*Log[x] - (6*d^2*(a + b*Log[c*x^n]
))/x^2 + (48*d*e*(a + b*Log[c*x^n]))/x + (4*d^3*e^2*(a + b*Log[c*x^n]))/(d
+ e*x)^3 + (18*d^2*e^2*(a + b*Log[c*x^n]))/(d + e*x)^2 + (72*d*e^2*(a + b*L
og[c*x^n]))/(d + e*x) + (60*e^2*(a + b*Log[c*x^n])^2)/(b*n) - 72*b*e^2*n*(L
og[x] - Log[d + e*x]) + 22*b*e^2*n*Log[d + e*x] - 120*e^2*(a + b*Log[c*x^n]
)*Log[1 + (e*x)/d] - 120*b*e^2*n*PolyLog[2, -((e*x)/d)])/(12*d^6)
```

fricas [F] time = 0.71, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{4}x^{7}+4\,de^{3}x^{6}+6\,d^{2}e^{2}x^{5}+4\,d^{3}ex^{4}+d^{4}x^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^4*x^7 + 4*d*e^3*x^6 + 6*d^2*e^2*x^5 + 4*d^3*
e*x^4 + d^4*x^3), x)
```

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

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex+d\right)^{4}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^4*x^3), x)
```

maple [C] time = 0.21, size = 1324, normalized size = 5.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(e*x+d)^4,x)
```

```
[Out] 1/4*I*b*Pi*csgn(I*c*x^n)^3/d^4/x^2+10*b*n/d^6*e^2*ln(e*x+d)*ln(-1/d*e*x)-1/
2*b*ln(x^n)/d^4/x^2-3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e^2/
(e*x+d)^2+2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^5*e/x-1/2*a/d^4/x^2+3/2*a/d^
4*e^2/(e*x+d)^2+1/3*a*e^2/d^3/(e*x+d)^3+10*a/d^6*e^2*ln(x)-10*a/d^6*e^2*ln(
e*x+d)-1/2*b*ln(c)/d^4/x^2+4*a/d^5*e/x+6*a*e^2/d^5/(e*x+d)-5*I*b*Pi*csgn(I*
c*x^n)^2*csgn(I*c)/d^6*e^2*ln(e*x+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)/d^4/x^2-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3/(e*
x+d)^3-5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^6*e^2*ln(x)-2*I*b*Pi*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^5*e/x+5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)/d^6*e^2*ln(e*x+d)-3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*e^2/d^5/(e*x+d)+3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e^2/(e*x+d)^2+
3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^5/(e*x+d)+3/4*I*b*Pi*csgn(I*c*x^
n)^2*csgn(I*c)/d^4*e^2/(e*x+d)^2+5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^6*e
^2*ln(x)+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3/(e*x+d)^3+2*I*b*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)^2/d^5*e/x+5*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^6*e^
2*ln(x)-5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^6*e^2*ln(e*x+d)+3*I*b*Pi*csg
n(I*c*x^n)^2*csgn(I*c)*e^2/d^5/(e*x+d)+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
^2*e^2/d^3/(e*x+d)^3+1/3*b*ln(c)*e^2/d^3/(e*x+d)^3+10*b*ln(c)/d^6*e^2*ln(x)
-10*b*ln(c)/d^6*e^2*ln(e*x+d)+4*b*ln(c)/d^5*e/x+6*b*ln(c)*e^2/d^5/(e*x+d)+3
/2*b*ln(c)/d^4*e^2/(e*x+d)^2-5*b*n/d^6*e^2*ln(x)^2+10*b*n/d^6*e^2*dilog(-1/
d*e*x)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4/x^2-5*I*b*Pi*csgn(I*c*x^n
```

```
)^3/d^6*e^2*ln(x)+4*b*e*n/d^5/x-1/6*b*e^2*n/d^4/(e*x+d)^2-11/6*b*e^2*n/d^5/
(e*x+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4/x^2-3*I*b*Pi*csgn(I*c*x^n)
^3*e^2/d^5/(e*x+d)-3/4*I*b*Pi*csgn(I*c*x^n)^3/d^4*e^2/(e*x+d)^2-1/6*I*b*Pi*
csgn(I*c*x^n)^3*e^2/d^3/(e*x+d)^3+4*b*ln(x^n)/d^5*e/x-10*b*ln(x^n)/d^6*e^2*
ln(e*x+d)+6*b*ln(x^n)*e^2/d^5/(e*x+d)+3/2*b*ln(x^n)/d^4*e^2/(e*x+d)^2+1/3*b
*ln(x^n)*e^2/d^3/(e*x+d)^3+10*b*ln(x^n)/d^6*e^2*ln(x)-2*I*b*Pi*csgn(I*c*x^n
)^3/d^5*e/x+5*I*b*Pi*csgn(I*c*x^n)^3/d^6*e^2*ln(e*x+d)-1/4*b*n/d^4/x^2-47/6
*b*e^2*n*ln(x)/d^6+47/6*b*e^2*n*ln(e*x+d)/d^6
```

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

$$\frac{1}{6}\,a\left(\frac{60\,e^4x^4+150\,de^3x^3+110\,d^2e^2x^2+15\,d^3ex-3\,d^4}{d^5e^3x^5+3\,d^6e^2x^4+3\,d^7ex^3+d^8x^2}-\frac{60\,e^2\log\left(ex+d\right)}{d^6}+\frac{60\,e^2\log(x)}{d^6}\right)+b\int\frac{}{e^4x^7+4\,de^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/6*a*((60*e^4*x^4 + 150*d*e^3*x^3 + 110*d^2*e^2*x^2 + 15*d^3*e*x - 3*d^4)/
(d^5*e^3*x^5 + 3*d^6*e^2*x^4 + 3*d^7*e*x^3 + d^8*x^2) - 60*e^2*log(e*x + d)
/d^6 + 60*e^2*log(x)/d^6) + b*integrate((log(c) + log(x^n))/(e^4*x^7 + 4*d*
e^3*x^6 + 6*d^2*e^2*x^5 + 4*d^3*e*x^4 + d^4*x^3), x)
```

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

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,{\left(d+e\,x\right)}^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x)^4),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x)^4), x)
```

sympy [A] time = 148.35, size = 649, normalized size = 2.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(e*x+d)**4,x)
```

```
[Out] -a*e**3*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))/d**3 -
 3*a*e**3*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/d**4
 - a/(2*d**4*x**2) - 6*a*e**3*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2
*x), True))/d**5 + 4*a*e/(d**5*x) - 10*a*e**3*Piecewise((x/d, Eq(e, 0)), (l
og(d + e*x)/e, True))/d**6 + 10*a*e**2*log(x)/d**6 + b*e**3*n*Piecewise((x/
d**4, Eq(e, 0)), (-3*d/(6*d**4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2) - 2*e
*x/(6*d**4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2) - log(x)/(3*d**3*e) + log
(d/e + x)/(3*d**3*e), True))/d**3 - b*e**3*Piecewise((x/d**4, Eq(e, 0)), (-
1/(3*e*(d + e*x)**3), True))*log(c*x**n)/d**3 + 3*b*e**3*n*Piecewise((x/d**
3, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/e + x
)/(2*d**2*e), True))/d**4 - 3*b*e**3*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e
*(d + e*x)**2), True))*log(c*x**n)/d**4 - b*n/(4*d**4*x**2) - b*log(c*x**n)
/(2*d**4*x**2) + 6*b*e**3*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) +
log(d/e + x)/(d*e), True))/d**5 - 6*b*e**3*Piecewise((x/d**2, Eq(e, 0)), (-
1/(d*e + e**2*x), True))*log(c*x**n)/d**5 + 4*b*e*n/(d**5*x) + 4*b*e*log(c*
x**n)/(d**5*x) + 10*b*e**3*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*
log(x) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x)
- polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)),
 ((0, 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) -
polylog(2, e*x*exp_polar(I*pi)/d), True))/e, True))/d**6 - 10*b*e**3*Piecew
ise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/d**6 - 5*b*e**2*n*
log(x)**2/d**6 + 10*b*e**2*log(x)*log(c*x**n)/d**6
```

3.62 $\int \frac{x^8(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=329

$$\frac{d^2\log\left(\frac{ex}{d}+1\right)\left(280a+280b\log\left(cx^n\right)+341bn\right)}{10e^9}-\frac{x^3\left(840a+840b\log\left(cx^n\right)+743bn\right)}{90e^6(d+ex)}-\frac{x^4\left(840a+840b\log\left(cx^n\right.\right.}{360e^5(d+ex)^2}$$

```
[Out] 28*b*d*n*x/e^8-1/10*d*(341*b*n+280*a)*x/e^8-7*b*n*x^2/e^7-28*b*d*x*ln(c*x^n
)/e^8-1/6*x^8*(a+b*ln(c*x^n))/e/(e*x+d)^6-1/30*x^7*(8*a+b*n+8*b*ln(c*x^n))/
e^2/(e*x+d)^5-1/120*x^6*(56*a+15*b*n+56*b*ln(c*x^n))/e^3/(e*x+d)^4-1/180*x^
5*(168*a+73*b*n+168*b*ln(c*x^n))/e^4/(e*x+d)^3+1/20*x^2*(280*a+341*b*n+280*
b*ln(c*x^n))/e^7-1/360*x^4*(840*a+533*b*n+840*b*ln(c*x^n))/e^5/(e*x+d)^2-1/
90*x^3*(840*a+743*b*n+840*b*ln(c*x^n))/e^6/(e*x+d)+1/10*d^2*(280*a+341*b*n+
280*b*ln(c*x^n))*ln(1+e*x/d)/e^9+28*b*d^2*n*polylog(2,-e*x/d)/e^9
```

Rubi [A] time = 0.64, antiderivative size = 394, normalized size of antiderivative = 1.20, number of steps used = 24, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {43, 2351, 2295, 2304, 2319, 44, 2314, 31, 2317, 2391}

$$\frac{28bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^9}-\frac{d^8\left(a+b\log\left(cx^n\right)\right)}{6e^9(d+ex)^6}+\frac{8d^7\left(a+b\log\left(cx^n\right)\right)}{5e^9(d+ex)^5}-\frac{7d^6\left(a+b\log\left(cx^n\right)\right)}{e^9(d+ex)^4}+\frac{56d^5\left(a+b\log\left(cx^n\right.\right.}{3e^9(d+ex)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^8*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (-7*a*d*x)/e^8 + (7*b*d*n*x)/e^8 - (b*n*x^2)/(4*e^7) + (b*d^7*n)/(30*e^9*(d
 + e*x)^5) - (43*b*d^6*n)/(120*e^9*(d + e*x)^4) + (167*b*d^5*n)/(90*e^9*(d
+ e*x)^3) - (131*b*d^4*n)/(20*e^9*(d + e*x)^2) + (219*b*d^3*n)/(10*e^9*(d +
 e*x)) + (219*b*d^2*n*Log[x])/(10*e^9) - (7*b*d*x*Log[c*x^n])/e^8 + (x^2*(a
 + b*Log[c*x^n]))/(2*e^7) - (d^8*(a + b*Log[c*x^n]))/(6*e^9*(d + e*x)^6) +
(8*d^7*(a + b*Log[c*x^n]))/(5*e^9*(d + e*x)^5) - (7*d^6*(a + b*Log[c*x^n]))
/(e^9*(d + e*x)^4) + (56*d^5*(a + b*Log[c*x^n]))/(3*e^9*(d + e*x)^3) - (35*
d^4*(a + b*Log[c*x^n]))/(e^9*(d + e*x)^2) - (56*d^2*x*(a + b*Log[c*x^n]))/(
e^8*(d + e*x)) + (341*b*d^2*n*Log[d + e*x])/(10*e^9) + (28*d^2*(a + b*Log[c
*x^n])*Log[1 + (e*x)/d])/e^9 + (28*b*d^2*n*PolyLog[2, -((e*x)/d)])/e^9
```

Rule 31

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

Rule 43

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x^8\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^7}\,dx = \int \left(-\frac{7d\left(a+b\log\left(cx^n\right)\right)}{e^8} + \frac{x\left(a+b\log\left(cx^n\right)\right)}{e^7} + \frac{d^8\left(a+b\log\left(cx^n\right)\right)}{e^8(d+ex)^7} - \frac{8d^7\left(a+b\log\right.}{e^8(d+e}\right.$$

$$= -\frac{(7d)\int\left(a+b\log\left(cx^n\right)\right)dx}{e^8} + \frac{\left(28d^2\right)\int\frac{a+b\log(cx^n)}{d+ex}dx}{e^8} - \frac{\left(56d^3\right)\int\frac{a+b\log(cx^n)}{(d+ex)^2}dx}{e^8} + \frac{(7}{}$$

$$= -\frac{7adx}{e^8} - \frac{bnx^2}{4e^7} + \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^7} - \frac{d^8\left(a+b\log\left(cx^n\right)\right)}{6e^9(d+ex)^6} + \frac{8d^7\left(a+b\log\left(cx^n\right)\right)}{5e^9(d+ex)^5}$$

$$= -\frac{7adx}{e^8} + \frac{7bdnx}{e^8} - \frac{bnx^2}{4e^7} - \frac{7bdx\log\left(cx^n\right)}{e^8} + \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^7} - \frac{d^8\left(a+b\log\left(cx^n\right.\right.}{6e^9(d+ex)^6}$$

$$= -\frac{7adx}{e^8} + \frac{7bdnx}{e^8} - \frac{bnx^2}{4e^7} + \frac{bd^7n}{30e^9(d+ex)^5} - \frac{43bd^6n}{120e^9(d+ex)^4} + \frac{167bd^5n}{90e^9(d+ex)^3} - \frac{131}{20e^9(d}$$

Mathematica [A] time = 0.47, size = 403, normalized size = 1.22

$$-\frac{60ad^8}{(d+ex)^6} + \frac{576ad^7}{(d+ex)^5} - \frac{2520ad^6}{(d+ex)^4} + \frac{6720ad^5}{(d+ex)^3} - \frac{12600ad^4}{(d+ex)^2} + \frac{20160ad^3}{d+ex} + 10080ad^2\log\left(\frac{ex}{d}+1\right) - 2520adex + 180ae^2x^2 - \frac{60bd^8}{(d\cdot}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^8*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (-2520*a*d*e*x + 2520*b*d*e*n*x + 180*a*e^2*x^2 - 90*b*e^2*n*x^2 - (60*a*d^
8)/(d + e*x)^6 + (576*a*d^7)/(d + e*x)^5 + (12*b*d^7*n)/(d + e*x)^5 - (2520
*a*d^6)/(d + e*x)^4 - (129*b*d^6*n)/(d + e*x)^4 + (6720*a*d^5)/(d + e*x)^3
+ (668*b*d^5*n)/(d + e*x)^3 - (12600*a*d^4)/(d + e*x)^2 - (2358*b*d^4*n)/(d
 + e*x)^2 + (20160*a*d^3)/(d + e*x) + (7884*b*d^3*n)/(d + e*x) - 12276*b*d^
2*n*Log[x] - 2520*b*d*e*x*Log[c*x^n] + 180*b*e^2*x^2*Log[c*x^n] - (60*b*d^8
*Log[c*x^n])/(d + e*x)^6 + (576*b*d^7*Log[c*x^n])/(d + e*x)^5 - (2520*b*d^6
*Log[c*x^n])/(d + e*x)^4 + (6720*b*d^5*Log[c*x^n])/(d + e*x)^3 - (12600*b*d
^4*Log[c*x^n])/(d + e*x)^2 + (20160*b*d^3*Log[c*x^n])/(d + e*x) + 12276*b*d
^2*n*Log[d + e*x] + 10080*a*d^2*Log[1 + (e*x)/d] + 10080*b*d^2*Log[c*x^n]*L
og[1 + (e*x)/d] + 10080*b*d^2*n*PolyLog[2, -((e*x)/d)])/(360*e^9)
```

fricas [F] time = 0.87, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^8\log\left(cx^n\right)+ax^8}{e^7x^7+7\,de^6x^6+21\,d^2e^5x^5+35\,d^3e^4x^4+35\,d^4e^3x^3+21\,d^5e^2x^2+7\,d^6ex+d^7},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^8*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] integral((b*x^8*log(c*x^n) + a*x^8)/(e^7*x^7 + 7*d*e^6*x^6 + 21*d^2*e^5*x^5
 + 35*d^3*e^4*x^4 + 35*d^4*e^3*x^3 + 21*d^5*e^2*x^2 + 7*d^6*e*x + d^7), x)
```

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

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^8}{(ex+d)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^8*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^8/(e*x + d)^7, x)
```

maple [C] time = 0.24, size = 1768, normalized size = 5.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^8*(b*ln(c*x^n)+a)/(e*x+d)^7,x)
```

```
[Out] 14*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^9*d^2*ln(e*x+d)+28*b*ln(c)/e^9*d^2*
ln(e*x+d)-7*b*ln(c)/e^8*x*d-35*b*ln(c)/e^9*d^4/(e*x+d)^2-1/6*b*ln(c)*d^8/e^
9/(e*x+d)^6+56*b*ln(c)/e^9*d^3/(e*x+d)-7*b*ln(c)/e^9*d^6/(e*x+d)^4+8/5*b*ln
(c)/e^9*d^7/(e*x+d)^5+56/3*b*ln(c)/e^9*d^5/(e*x+d)^3-131/20*b*n/e^9*d^4/(e*
x+d)^2+167/90*b*n/e^9*d^5/(e*x+d)^3-43/120*b*n/e^9*d^6/(e*x+d)^4+1/30*b*n/e
^9*d^7/(e*x+d)^5-28*b*n/e^9*d^2*dilog(-1/d*e*x)-341/10*b*n/e^9*d^2*ln(e*x)+
341/10*b*n/e^9*d^2*ln(e*x+d)+219/10*b*n/e^9*d^3/(e*x+d)-1/4*I*b*Pi*csgn(I*c
*x^n)^3/e^7*x^2+28/3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^9*d^5/(e*x+d)^3-1/1
2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^8/e^9/(e*x+d)^6+56*a/e^9*d^3/(e*x+d)-7
*a/e^9*d^6/(e*x+d)^4+8/5*a/e^9*d^7/(e*x+d)^5+56/3*a/e^9*d^5/(e*x+d)^3+28*a/
e^9*d^2*ln(e*x+d)-7*a/e^8*x*d-35*a/e^9*d^4/(e*x+d)^2-1/6*a*d^8/e^9/(e*x+d)^
6+1/2*b*ln(c)/e^7*x^2+1/2*b*ln(x^n)/e^7*x^2+29/4*b*n/e^9*d^2-28*b*n/e^9*d^2
*ln(e*x+d)*ln(-1/d*e*x)-28*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^9*d
^3/(e*x+d)+7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^9*d^6/(e*x+d)^4
+1/2*a/e^7*x^2+28*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^9*d^3/(e*x+d)-7/2*I*b*
Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^8*x*d+8/5*b*ln(x^n)/e^9*d^7/(e*x+d)^5+28*b*l
n(x^n)/e^9*d^2*ln(e*x+d)+56/3*b*ln(x^n)/e^9*d^5/(e*x+d)^3-7*b*ln(x^n)/e^8*x
*d-35*b*ln(x^n)/e^9*d^4/(e*x+d)^2-1/6*b*ln(x^n)*d^8/e^9/(e*x+d)^6+56*b*ln(x
^n)/e^9*d^3/(e*x+d)-7*b*ln(x^n)/e^9*d^6/(e*x+d)^4-4/5*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)/e^9*d^7/(e*x+d)^5-14*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)/e^9*d^2*ln(e*x+d)-28/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)/e^9*d^5/(e*x+d)^3+28*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^9*d^3/(e*x+d)-2
8/3*I*b*Pi*csgn(I*c*x^n)^3/e^9*d^5/(e*x+d)^3+1/4*I*b*Pi*csgn(I*c*x^n)^2*csg
n(I*c)/e^7*x^2+7*b*d*n*x/e^8+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^7*x^2
-14*I*b*Pi*csgn(I*c*x^n)^3/e^9*d^2*ln(e*x+d)-4/5*I*b*Pi*csgn(I*c*x^n)^3/e^9
*d^7/(e*x+d)^5-28*I*b*Pi*csgn(I*c*x^n)^3/e^9*d^3/(e*x+d)+7/2*I*b*Pi*csgn(I*
c*x^n)^3/e^9*d^6/(e*x+d)^4+35/2*I*b*Pi*csgn(I*c*x^n)^3/e^9*d^4/(e*x+d)^2+1/
12*I*b*Pi*csgn(I*c*x^n)^3*d^8/e^9/(e*x+d)^6+1/12*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*d^8/e^9/(e*x+d)^6+35/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)/e^9*d^4/(e*x+d)^2+7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^
8*x*d-1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^8/e^9/(e*x+d)^6+4/5*I*b*Pi*
csgn(I*c*x^n)^2*csgn(I*c)/e^9*d^7/(e*x+d)^5-7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2/e^9*d^6/(e*x+d)^4+7/2*I*b*Pi*csgn(I*c*x^n)^3/e^8*x*d-35/2*I*b*Pi*cs
gn(I*c*x^n)^2*csgn(I*c)/e^9*d^4/(e*x+d)^2+14*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*
c)/e^9*d^2*ln(e*x+d)+4/5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^9*d^7/(e*x+d)
^5-7/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^9*d^6/(e*x+d)^4-35/2*I*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2/e^9*d^4/(e*x+d)^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)/e^7*x^2-7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^8*x*d+28/3*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^9*d^5/(e*x+d)^3-1/4*b*n*x^2/e^7
```

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

$$\frac{1}{30}\,a\left(\frac{1680\,d^3e^5x^5+7350\,d^4e^4x^4+13160\,d^5e^3x^3+11970\,d^6e^2x^2+5508\,d^7ex+1023\,d^8}{e^{15}x^6+6\,de^{14}x^5+15\,d^2e^{13}x^4+20\,d^3e^{12}x^3+15\,d^4e^{11}x^2+6\,d^5e^{10}x+d^6e^9}+\frac{840\,d^2\log\left(ex+d\right)}{e^9}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^8*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/30*a*((1680*d^3*e^5*x^5 + 7350*d^4*e^4*x^4 + 13160*d^5*e^3*x^3 + 11970*d^
6*e^2*x^2 + 5508*d^7*e*x + 1023*d^8)/(e^15*x^6 + 6*d*e^14*x^5 + 15*d^2*e^13
*x^4 + 20*d^3*e^12*x^3 + 15*d^4*e^11*x^2 + 6*d^5*e^10*x + d^6*e^9) + 840*d^
```

```
2*log(e*x + d)/e^9 + 15*(e*x^2 - 14*d*x)/e^8) + b*integrate((x^8*log(c) + x
^8*log(x^n))/(e^7*x^7 + 7*d*e^6*x^6 + 21*d^2*e^5*x^5 + 35*d^3*e^4*x^4 + 35*
d^4*e^3*x^3 + 21*d^5*e^2*x^2 + 7*d^6*e*x + d^7), x)
```

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

$$\int \frac{x^8\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(d+e\,x\right)}^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^8*(a + b*log(c*x^n)))/(d + e*x)^7,x)
```

```
[Out] int((x^8*(a + b*log(c*x^n)))/(d + e*x)^7, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**8*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Timed out
```

3.63 $\int \frac{x^7(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=285

$$-\frac{d\log\left(\frac{ex}{d}+1\right)\left(140a+140b\log\left(cx^n\right)+223bn\right)}{20e^8}-\frac{x^2\left(140a+140b\log\left(cx^n\right)+153bn\right)}{40e^6(d+ex)}-\frac{x^3\left(420a+420b\log\left(c\right.\right.}{360e^5(d+e}$$

```
[Out] -7*b*n*x/e^7+1/20*(223*b*n+140*a)*x/e^7+7*b*x*ln(c*x^n)/e^7-1/6*x^7*(a+b*ln
(c*x^n))/e/(e*x+d)^6-1/30*x^6*(7*a+b*n+7*b*ln(c*x^n))/e^2/(e*x+d)^5-1/120*x
^5*(42*a+13*b*n+42*b*ln(c*x^n))/e^3/(e*x+d)^4-1/40*x^2*(140*a+153*b*n+140*b
*ln(c*x^n))/e^6/(e*x+d)-1/360*x^4*(210*a+107*b*n+210*b*ln(c*x^n))/e^4/(e*x+
d)^3-1/360*x^3*(420*a+319*b*n+420*b*ln(c*x^n))/e^5/(e*x+d)^2-1/20*d*(140*a+
223*b*n+140*b*ln(c*x^n))*ln(1+e*x/d)/e^8-7*b*d*n*polylog(2,-e*x/d)/e^8
```

Rubi [A] time = 0.57, antiderivative size = 351, normalized size of antiderivative = 1.23, number of steps used = 23, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {43, 2351, 2295, 2319, 44, 2314, 31, 2317, 2391}

$$-\frac{7bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^8}+\frac{d^7\left(a+b\log\left(cx^n\right)\right)}{6e^8(d+ex)^6}-\frac{7d^6\left(a+b\log\left(cx^n\right)\right)}{5e^8(d+ex)^5}+\frac{21d^5\left(a+b\log\left(cx^n\right)\right)}{4e^8(d+ex)^4}-\frac{35d^4\left(a+b\log\left(\right.\right.}{3e^8(d+ex)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^7*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (a*x)/e^7 - (b*n*x)/e^7 - (b*d^6*n)/(30*e^8*(d + e*x)^5) + (37*b*d^5*n)/(12
0*e^8*(d + e*x)^4) - (241*b*d^4*n)/(180*e^8*(d + e*x)^3) + (153*b*d^3*n)/(4
0*e^8*(d + e*x)^2) - (197*b*d^2*n)/(20*e^8*(d + e*x)) - (197*b*d*n*Log[x])/
(20*e^8) + (b*x*Log[c*x^n])/e^7 + (d^7*(a + b*Log[c*x^n]))/(6*e^8*(d + e*x)
^6) - (7*d^6*(a + b*Log[c*x^n]))/(5*e^8*(d + e*x)^5) + (21*d^5*(a + b*Log[c
*x^n]))/(4*e^8*(d + e*x)^4) - (35*d^4*(a + b*Log[c*x^n]))/(3*e^8*(d + e*x)^
3) + (35*d^3*(a + b*Log[c*x^n]))/(2*e^8*(d + e*x)^2) + (21*d*x*(a + b*Log[c
*x^n]))/(e^7*(d + e*x)) - (223*b*d*n*Log[d + e*x])/(20*e^8) - (7*d*(a + b*L
og[c*x^n])*Log[1 + (e*x)/d])/e^8 - (7*b*d*n*PolyLog[2, -((e*x)/d)])/e^8
```

Rule 31

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

Rule 43

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x^7\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^7}\,dx = \int\Bigg(\frac{a+b\log\left(cx^n\right)}{e^7} - \frac{d^7\left(a+b\log\left(cx^n\right)\right)}{e^7(d+ex)^7} + \frac{7d^6\left(a+b\log\left(cx^n\right)\right)}{e^7(d+ex)^6} - \frac{21d^5\left(a+b\log\left(\right.\right.}{e^7(d+ex)^5}$$

$$= \frac{\int\left(a+b\log\left(cx^n\right)\right)dx}{e^7} - \frac{(7d)\int\frac{a+b\log(cx^n)}{d+ex}\,dx}{e^7} + \frac{\left(21d^2\right)\int\frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^7} - \frac{\left(35d^3\right)\int\frac{a\cdot}{}}{e}$$

$$= \frac{ax}{e^7} + \frac{d^7\left(a+b\log\left(cx^n\right)\right)}{6e^8(d+ex)^6} - \frac{7d^6\left(a+b\log\left(cx^n\right)\right)}{5e^8(d+ex)^5} + \frac{21d^5\left(a+b\log\left(cx^n\right)\right)}{4e^8(d+ex)^4} - \frac{35d^4\left(a\right.}{3e^8}$$

$$= \frac{ax}{e^7} - \frac{bnx}{e^7} + \frac{bx\log\left(cx^n\right)}{e^7} + \frac{d^7\left(a+b\log\left(cx^n\right)\right)}{6e^8(d+ex)^6} - \frac{7d^6\left(a+b\log\left(cx^n\right)\right)}{5e^8(d+ex)^5} + \frac{21d^5\left(a+b\right.}{4e^8(d}$$

$$= \frac{ax}{e^7} - \frac{bnx}{e^7} - \frac{bd^6n}{30e^8(d+ex)^5} + \frac{37bd^5n}{120e^8(d+ex)^4} - \frac{241bd^4n}{180e^8(d+ex)^3} + \frac{153bd^3n}{40e^8(d+ex)^2} - \frac{1}{20e}$$

Mathematica [A] time = 0.52, size = 356, normalized size = 1.25

$$-\frac{-\frac{60ad^7}{(d+ex)^6} + \frac{504ad^6}{(d+ex)^5} - \frac{1890ad^5}{(d+ex)^4} + \frac{4200ad^4}{(d+ex)^3} - \frac{6300ad^3}{(d+ex)^2} + \frac{7560ad^2}{d+ex} + 2520ad\log\left(\frac{ex}{d}+1\right) - 360aex - \frac{60bd^7\log(cx^n)}{(d+ex)^6} + \frac{504bd^6\log}{(d+ex}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^7*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -1/360*(-360*a*e*x + 360*b*e*n*x - (60*a*d^7)/(d + e*x)^6 + (504*a*d^6)/(d
+ e*x)^5 + (12*b*d^6*n)/(d + e*x)^5 - (1890*a*d^5)/(d + e*x)^4 - (111*b*d^5
*n)/(d + e*x)^4 + (4200*a*d^4)/(d + e*x)^3 + (482*b*d^4*n)/(d + e*x)^3 - (6
300*a*d^3)/(d + e*x)^2 - (1377*b*d^3*n)/(d + e*x)^2 + (7560*a*d^2)/(d + e*x
) + (3546*b*d^2*n)/(d + e*x) - 4014*b*d*n*Log[x] - 360*b*e*x*Log[c*x^n] - (
60*b*d^7*Log[c*x^n])/(d + e*x)^6 + (504*b*d^6*Log[c*x^n])/(d + e*x)^5 - (18
90*b*d^5*Log[c*x^n])/(d + e*x)^4 + (4200*b*d^4*Log[c*x^n])/(d + e*x)^3 - (6
300*b*d^3*Log[c*x^n])/(d + e*x)^2 + (7560*b*d^2*Log[c*x^n])/(d + e*x) + 401
4*b*d*n*Log[d + e*x] + 2520*a*d*Log[1 + (e*x)/d] + 2520*b*d*Log[c*x^n]*Log[
1 + (e*x)/d] + 2520*b*d*n*PolyLog[2, -((e*x)/d)])/e^8
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^7 \log\left(cx^n\right) + ax^7}{e^7x^7 + 7\,de^6x^6 + 21\,d^2e^5x^5 + 35\,d^3e^4x^4 + 35\,d^4e^3x^3 + 21\,d^5e^2x^2 + 7\,d^6ex + d^7}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*x^7*log(c*x^n) + a*x^7)/(e^7*x^7 + 7*d*e^6*x^6 + 21*d^2*e^5*x^5
 + 35*d^3*e^4*x^4 + 35*d^4*e^3*x^3 + 21*d^5*e^2*x^2 + 7*d^6*e*x + d^7), x)
```

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

$$\int \frac{\left(b \log\left(cx^n\right) + a\right)x^7}{\left(ex + d\right)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((b*log(c*x^n) + a)*x^7/(e*x + d)^7, x)
```

maple [C] time = 0.24, size = 1584, normalized size = 5.56

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7*(b*ln(c*x^n)+a)/(e*x+d)^7,x)
```

```
[Out] -1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^7*x-35/3*b*ln(c)/e^8*d^4/
(e*x+d)^3-7*b*ln(c)/e^8*d*ln(e*x+d)+35/2*b*ln(c)/e^8*d^3/(e*x+d)^2+1/6*b*ln
(c)*d^7/e^8/(e*x+d)^6+21/4*b*ln(c)/e^8*d^5/(e*x+d)^4-7/5*b*ln(c)/e^8*d^6/(e
*x+d)^5-21*b*ln(c)/e^8*d^2/(e*x+d)+223/20*b*n/e^8*d*ln(e*x)-223/20*b*n/e^8*
d*ln(e*x+d)-197/20*b*n/e^8*d^2/(e*x+d)+153/40*b*n/e^8*d^3/(e*x+d)^2-241/180
*b*n/e^8*d^4/(e*x+d)^3+37/120*b*n/e^8*d^5/(e*x+d)^4-1/30*b*n/e^8*d^6/(e*x+d
)^5+7*b*n/e^8*d*dilog(-1/d*e*x)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^7*x-
21/8*I*b*Pi*csgn(I*c*x^n)^3/e^8*d^5/(e*x+d)^4-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^
7*x+35/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^8*d^3/(e*x+d)^2+1/6*a*d^7/e^8/(
e*x+d)^6+21/4*a/e^8*d^5/(e*x+d)^4-7/5*a/e^8*d^6/(e*x+d)^5-21*a/e^8*d^2/(e*x
+d)-35/3*a/e^8*d^4/(e*x+d)^3-7*a/e^8*d*ln(e*x+d)+35/2*a/e^8*d^3/(e*x+d)^2+b
*ln(c)/e^7*x-b*n/e^8*d-21/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^8*
d^5/(e*x+d)^4+7/10*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^8*d^6/(e*x+
d)^5+35/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^8*d^4/(e*x+d)^3+7*b*
n/e^8*d*ln(e*x+d)*ln(-1/d*e*x)-1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*d^7/e^8/(e*x+d)^6+a/e^7*x+b*ln(x^n)/e^7*x+21/4*b*ln(x^n)/e^8*d^5/(e*x+d
```

```
)^4-7/5*b*ln(x^n)/e^8*d^6/(e*x+d)^5-21*b*ln(x^n)/e^8*d^2/(e*x+d)-7*b*ln(x^n
)/e^8*d*ln(e*x+d)-35/3*b*ln(x^n)/e^8*d^4/(e*x+d)^3+1/6*b*ln(x^n)*d^7/e^8/(e
*x+d)^6+35/2*b*ln(x^n)/e^8*d^3/(e*x+d)^2-21/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)^2/e^8*d^2/(e*x+d)+35/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^8*d^3/(e*x+
d)^2+21/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^8*d^5/(e*x+d)^4-7/10*I*b*Pi*
csgn(I*c*x^n)^2*csgn(I*c)/e^8*d^6/(e*x+d)^5+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2/e^7*x+35/6*I*b*Pi*csgn(I*c*x^n)^3/e^8*d^4/(e*x+d)^3+21/2*I*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^8*d^2/(e*x+d)-35/4*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)/e^8*d^3/(e*x+d)^2+7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)/e^8*d*ln(e*x+d)-35/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^8*d^4
/(e*x+d)^3+1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^7/e^8/(e*x+d)^6-7/10*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^8*d^6/(e*x+d)^5-1/12*I*b*Pi*csgn(I*c*x^
n)^3*d^7/e^8/(e*x+d)^6+7/10*I*b*Pi*csgn(I*c*x^n)^3/e^8*d^6/(e*x+d)^5-35/4*I
*b*Pi*csgn(I*c*x^n)^3/e^8*d^3/(e*x+d)^2+21/2*I*b*Pi*csgn(I*c*x^n)^3/e^8*d^2
/(e*x+d)+7/2*I*b*Pi*csgn(I*c*x^n)^3/e^8*d*ln(e*x+d)+1/12*I*b*Pi*csgn(I*c*x^
n)^2*csgn(I*c)*d^7/e^8/(e*x+d)^6-7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^8
*d*ln(e*x+d)-21/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^8*d^2/(e*x+d)-7/2*I*b*
Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^8*d*ln(e*x+d)-35/6*I*b*Pi*csgn(I*c*x^n)^2*cs
gn(I*c)/e^8*d^4/(e*x+d)^3+21/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^8*d^5/(e*
x+d)^4-b*n*x/e^7
```

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

$$-\frac{1}{60}\,a\left(\frac{1260\,d^2e^5x^5 + 5250\,d^3e^4x^4 + 9100\,d^4e^3x^3 + 8085\,d^5e^2x^2 + 3654\,d^6ex + 669\,d^7}{e^{14}x^6 + 6\,de^{13}x^5 + 15\,d^2e^{12}x^4 + 20\,d^3e^{11}x^3 + 15\,d^4e^{10}x^2 + 6\,d^5e^9x + d^6e^8} - \frac{60\,x}{e^7} + \frac{420\,d\log(ex+d)}{e^8}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/60*a*((1260*d^2*e^5*x^5 + 5250*d^3*e^4*x^4 + 9100*d^4*e^3*x^3 + 8085*d^5
*e^2*x^2 + 3654*d^6*e*x + 669*d^7)/(e^14*x^6 + 6*d*e^13*x^5 + 15*d^2*e^12*x
^4 + 20*d^3*e^11*x^3 + 15*d^4*e^10*x^2 + 6*d^5*e^9*x + d^6*e^8) - 60*x/e^7
+ 420*d*log(e*x + d)/e^8) + b*integrate((x^7*log(c) + x^7*log(x^n))/(e^7*x^
7 + 7*d*e^6*x^6 + 21*d^2*e^5*x^5 + 35*d^3*e^4*x^4 + 35*d^4*e^3*x^3 + 21*d^5
*e^2*x^2 + 7*d^6*e*x + d^7), x)
```

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

$$\int \frac{x^7\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(d+e\,x\right)}^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^7*(a + b*log(c*x^n)))/(d + e*x)^7,x)
```

```
[Out] int((x^7*(a + b*log(c*x^n)))/(d + e*x)^7, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**7*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Timed out
```

3.64 $\int \frac{x^6(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=243

$$\frac{\log\left(\frac{ex}{d}+1\right)\left(20a+20b\log\left(cx^n\right)+49bn\right)}{20e^7}-\frac{x\left(20a+20b\log\left(cx^n\right)+29bn\right)}{20e^6(d+ex)}-\frac{x^2\left(20a+20b\log\left(cx^n\right)+19bn\right)}{40e^5(d+ex)^2}-$$

```
[Out] -1/6*x^6*(a+b*ln(c*x^n))/e/(e*x+d)^6-1/30*x^5*(6*a+b*n+6*b*ln(c*x^n))/e^2/(
e*x+d)^5-1/40*x^2*(20*a+19*b*n+20*b*ln(c*x^n))/e^5/(e*x+d)^2-1/20*x*(20*a+2
9*b*n+20*b*ln(c*x^n))/e^6/(e*x+d)-1/120*x^4*(30*a+11*b*n+30*b*ln(c*x^n))/e^
3/(e*x+d)^4-1/180*x^3*(60*a+37*b*n+60*b*ln(c*x^n))/e^4/(e*x+d)^3+1/20*(20*a
+49*b*n+20*b*ln(c*x^n))*ln(1+e*x/d)/e^7+b*n*polylog(2,-e*x/d)/e^7
```

Rubi [A] time = 0.54, antiderivative size = 316, normalized size of antiderivative = 1.30, number of steps used = 21, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {43, 2351, 2319, 44, 2314, 31, 2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^7}-\frac{d^6\left(a+b\log\left(cx^n\right)\right)}{6e^7(d+ex)^6}+\frac{6d^5\left(a+b\log\left(cx^n\right)\right)}{5e^7(d+ex)^5}-\frac{15d^4\left(a+b\log\left(cx^n\right)\right)}{4e^7(d+ex)^4}+\frac{20d^3\left(a+b\log\left(cx^n\right)\right)}{3e^7(d+ex)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^6*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (b*d^5*n)/(30*e^7*(d + e*x)^5) - (31*b*d^4*n)/(120*e^7*(d + e*x)^4) + (163*
b*d^3*n)/(180*e^7*(d + e*x)^3) - (79*b*d^2*n)/(40*e^7*(d + e*x)^2) + (71*b*
d*n)/(20*e^7*(d + e*x)) + (71*b*n*Log[x])/(20*e^7) - (d^6*(a + b*Log[c*x^n]
))/(6*e^7*(d + e*x)^6) + (6*d^5*(a + b*Log[c*x^n]))/(5*e^7*(d + e*x)^5) - (
15*d^4*(a + b*Log[c*x^n]))/(4*e^7*(d + e*x)^4) + (20*d^3*(a + b*Log[c*x^n])
)/(3*e^7*(d + e*x)^3) - (15*d^2*(a + b*Log[c*x^n]))/(2*e^7*(d + e*x)^2) - (
6*x*(a + b*Log[c*x^n]))/(e^6*(d + e*x)) + (49*b*n*Log[d + e*x])/(20*e^7) +
((a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^7 + (b*n*PolyLog[2, -((e*x)/d)])/e^
7
```

Rule 31

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

Rule 43

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
```

```
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{x^6\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^7}\,dx=\int\left(\frac{d^6\left(a+b\log\left(cx^n\right)\right)}{e^6(d+ex)^7}-\frac{6d^5\left(a+b\log\left(cx^n\right)\right)}{e^6(d+ex)^6}+\frac{15d^4\left(a+b\log\left(cx^n\right)\right)}{e^6(d+ex)^5}-\frac{20d^3\left(a+\right.}{e^6(d}\right.$$

$$=\frac{\int\frac{a+b\log(cx^n)}{d+ex}\,dx}{e^6}-\frac{(6d)\int\frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^6}+\frac{\left(15d^2\right)\int\frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{e^6}-\frac{\left(20d^3\right)\int\frac{a+b\log(cx}{(d+ex)^4}}{e^6}$$

$$=-\frac{d^6\left(a+b\log\left(cx^n\right)\right)}{6e^7(d+ex)^6}+\frac{6d^5\left(a+b\log\left(cx^n\right)\right)}{5e^7(d+ex)^5}-\frac{15d^4\left(a+b\log\left(cx^n\right)\right)}{4e^7(d+ex)^4}+\frac{20d^3\left(a+b\right.}{3e^7(d+}$$

$$=-\frac{d^6\left(a+b\log\left(cx^n\right)\right)}{6e^7(d+ex)^6}+\frac{6d^5\left(a+b\log\left(cx^n\right)\right)}{5e^7(d+ex)^5}-\frac{15d^4\left(a+b\log\left(cx^n\right)\right)}{4e^7(d+ex)^4}+\frac{20d^3\left(a+b\right.}{3e^7(d+}$$

$$=\frac{bd^5n}{30e^7(d+ex)^5}-\frac{31bd^4n}{120e^7(d+ex)^4}+\frac{163bd^3n}{180e^7(d+ex)^3}-\frac{79bd^2n}{40e^7(d+ex)^2}+\frac{71bdn}{20e^7(d+ex)}+$$

Mathematica [A] time = 0.46, size = 333, normalized size = 1.37

$$\frac{-60ad^6+432ad^5(d+ex)-1350ad^4(d+ex)^2+2400ad^3(d+ex)^3-2700ad^2(d+ex)^4+2160ad(d+ex)^5+360a(d+ex)^6\log\left(\frac{ex}{d}+1\right)-60bd^6\log\left(cx^n\right)+432bd^5(d+ex)\,l}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^6*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (-882*b*n*Log[x] + (-60*a*d^6 + 432*a*d^5*(d + e*x) + 12*b*d^5*n*(d + e*x)
- 1350*a*d^4*(d + e*x)^2 - 93*b*d^4*n*(d + e*x)^2 + 2400*a*d^3*(d + e*x)^3
+ 326*b*d^3*n*(d + e*x)^3 - 2700*a*d^2*(d + e*x)^4 - 711*b*d^2*n*(d + e*x)^
4 + 2160*a*d*(d + e*x)^5 + 1278*b*d*n*(d + e*x)^5 - 60*b*d^6*Log[c*x^n] + 4
32*b*d^5*(d + e*x)*Log[c*x^n] - 1350*b*d^4*(d + e*x)^2*Log[c*x^n] + 2400*b*
d^3*(d + e*x)^3*Log[c*x^n] - 2700*b*d^2*(d + e*x)^4*Log[c*x^n] + 2160*b*d*(
d + e*x)^5*Log[c*x^n] + 882*b*n*(d + e*x)^6*Log[d + e*x] + 360*a*(d + e*x)^
6*Log[1 + (e*x)/d] + 360*b*(d + e*x)^6*Log[c*x^n]*Log[1 + (e*x)/d])/(d + e*
x)^6 + 360*b*n*PolyLog[2, -((e*x)/d)])/(360*e^7)
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^6\log\left(cx^n\right)+ax^6}{e^7x^7+7\,de^6x^6+21\,d^2e^5x^5+35\,d^3e^4x^4+35\,d^4e^3x^3+21\,d^5e^2x^2+7\,d^6ex+d^7},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] integral((b*x^6*log(c*x^n) + a*x^6)/(e^7*x^7 + 7*d*e^6*x^6 + 21*d^2*e^5*x^5
 + 35*d^3*e^4*x^4 + 35*d^4*e^3*x^3 + 21*d^5*e^2*x^2 + 7*d^6*e*x + d^7), x)
```

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

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x^6}{\left(ex+d\right)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^6/(e*x + d)^7, x)
```

maple [C] time = 0.20, size = 1416, normalized size = 5.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^6*(b*ln(c*x^n)+a)/(e*x+d)^7,x)
```

```
[Out] -1/12*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^6/e^7/(e*x+d)^6+6/5*b*ln(c)*d^5/e^
7/(e*x+d)^5+6*b*ln(c)*d/e^7/(e*x+d)-15/2*b*ln(c)*d^2/e^7/(e*x+d)^2-1/6*b*ln
(c)*d^6/e^7/(e*x+d)^6-15/4*b*ln(c)*d^4/e^7/(e*x+d)^4+20/3*b*ln(c)*d^3/e^7/(
e*x+d)^3-3*I*b*Pi*csgn(I*c*x^n)^3*d/e^7/(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)^2/e^7*ln(e*x+d)+71/20*b*n*d/e^7/(e*x+d)-79/40*b*n*d^2/e^7/(e*x+d)
^2+163/180*b*n*d^3/e^7/(e*x+d)^3-31/120*b*n*d^4/e^7/(e*x+d)^4+1/30*b*n*d^5/
e^7/(e*x+d)^5-b*n/e^7*ln(e*x+d)*ln(-1/d*e*x)-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^7
*ln(e*x+d)+3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^7/(e*x+d)-15/8*I*b*Pi*csg
n(I*c*x^n)^2*csgn(I*c)*d^4/e^7/(e*x+d)^4+b*ln(x^n)/e^7*ln(e*x+d)+a/e^7*ln(e
*x+d)+6*a*d/e^7/(e*x+d)-15/4*a*d^4/e^7/(e*x+d)^4+20/3*a*d^3/e^7/(e*x+d)^3-1
/6*a*d^6/e^7/(e*x+d)^6+6/5*a*d^5/e^7/(e*x+d)^5-15/2*a*d^2/e^7/(e*x+d)^2+b*l
n(c)/e^7*ln(e*x+d)-15/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^7/(e*x+d)^2+
15/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^7/(e*x+d)^2+15/8*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^4/e^7/(e*x+d)^4-15/4*I*b*Pi*csgn(I
*x^n)*csgn(I*c*x^n)^2*d^2/e^7/(e*x+d)^2-49/20*b*n/e^7*ln(e*x)+49/20*b*n/e^7
*ln(e*x+d)-b*n/e^7*dilog(-1/d*e*x)-1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*
d^6/e^7/(e*x+d)^6+6*b*ln(x^n)*d/e^7/(e*x+d)-15/4*b*ln(x^n)*d^4/e^7/(e*x+d)^
4+20/3*b*ln(x^n)*d^3/e^7/(e*x+d)^3-15/2*b*ln(x^n)*d^2/e^7/(e*x+d)^2-1/6*b*l
n(x^n)*d^6/e^7/(e*x+d)^6+6/5*b*ln(x^n)*d^5/e^7/(e*x+d)^5-1/2*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)/e^7*ln(e*x+d)+10/3*I*b*Pi*csgn(I*c*x^n)^2*csgn
(I*c)*d^3/e^7/(e*x+d)^3+3/5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^5/e^7/(e*x
```

```
+d)^5+3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^7/(e*x+d)+3/5*I*b*Pi*csgn(I*
c*x^n)^2*csgn(I*c)*d^5/e^7/(e*x+d)^5+15/4*I*b*Pi*csgn(I*c*x^n)^3*d^2/e^7/(e
*x+d)^2+1/12*I*b*Pi*csgn(I*c*x^n)^3*d^6/e^7/(e*x+d)^6-3/5*I*b*Pi*csgn(I*c*x
^n)^3*d^5/e^7/(e*x+d)^5-3/5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^5/
e^7/(e*x+d)^5-3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^7/(e*x+d)-10
/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^3/e^7/(e*x+d)^3+1/12*I*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^6/e^7/(e*x+d)^6+10/3*I*b*Pi*csgn(I*x
^n)*csgn(I*c*x^n)^2*d^3/e^7/(e*x+d)^3+15/8*I*b*Pi*csgn(I*c*x^n)^3*d^4/e^7/(
e*x+d)^4-15/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^4/e^7/(e*x+d)^4-10/3*I*b
*Pi*csgn(I*c*x^n)^3*d^3/e^7/(e*x+d)^3+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/
e^7*ln(e*x+d)
```

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

$$\frac{1}{60}\,a\left(\frac{360\,de^5x^5+1350\,d^2e^4x^4+2200\,d^3e^3x^3+1875\,d^4e^2x^2+822\,d^5ex+147\,d^6}{e^{13}x^6+6\,de^{12}x^5+15\,d^2e^{11}x^4+20\,d^3e^{10}x^3+15\,d^4e^9x^2+6\,d^5e^8x+d^6e^7}+\frac{60\,\log\left(ex+d\right)}{e^7}\right)+b\int\frac{}{e^7x^7+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/60*a*((360*d*e^5*x^5 + 1350*d^2*e^4*x^4 + 2200*d^3*e^3*x^3 + 1875*d^4*e^2
*x^2 + 822*d^5*e*x + 147*d^6)/(e^13*x^6 + 6*d*e^12*x^5 + 15*d^2*e^11*x^4 +
20*d^3*e^10*x^3 + 15*d^4*e^9*x^2 + 6*d^5*e^8*x + d^6*e^7) + 60*log(e*x + d)
/e^7) + b*integrate((x^6*log(c) + x^6*log(x^n))/(e^7*x^7 + 7*d*e^6*x^6 + 21
*d^2*e^5*x^5 + 35*d^3*e^4*x^4 + 35*d^4*e^3*x^3 + 21*d^5*e^2*x^2 + 7*d^6*e*x
 + d^7), x)
```

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

$$\int \frac{x^6\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(d+e\,x\right)}^7} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^6*(a + b*log(c*x^n)))/(d + e*x)^7,x)
```

```
[Out] int((x^6*(a + b*log(c*x^n)))/(d + e*x)^7, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**6*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Timed out
```

3.65 $\int \frac{x^5(a+b\log(cx^n))}{(d+ex)^7} dx$

Optimal. Leaf size=136

$$\frac{x^6(a+b\log(cx^n))}{6d(d+ex)^6}-\frac{bd^4n}{30e^6(d+ex)^5}+\frac{5bd^3n}{24e^6(d+ex)^4}-\frac{5bd^2n}{9e^6(d+ex)^3}-\frac{5bn}{6e^6(d+ex)}+\frac{5bdn}{6e^6(d+ex)^2}-\frac{bn\log(d+ex)}{6de^6}$$

```
[Out] -1/30*b*d^4*n/e^6/(e*x+d)^5+5/24*b*d^3*n/e^6/(e*x+d)^4-5/9*b*d^2*n/e^6/(e*x
+d)^3+5/6*b*d*n/e^6/(e*x+d)^2-5/6*b*n/e^6/(e*x+d)+1/6*x^6*(a+b*ln(c*x^n))/d
/(e*x+d)^6-1/6*b*n*ln(e*x+d)/d/e^6
```

Rubi [A] time = 0.11, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2335, 43}

$$\frac{x^6(a+b\log(cx^n))}{6d(d+ex)^6}-\frac{5bd^2n}{9e^6(d+ex)^3}+\frac{5bd^3n}{24e^6(d+ex)^4}-\frac{bd^4n}{30e^6(d+ex)^5}-\frac{5bn}{6e^6(d+ex)}+\frac{5bdn}{6e^6(d+ex)^2}-\frac{bn\log(d+ex)}{6de^6}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -(b*d^4*n)/(30*e^6*(d + e*x)^5) + (5*b*d^3*n)/(24*e^6*(d + e*x)^4) - (5*b*d
^2*n)/(9*e^6*(d + e*x)^3) + (5*b*d*n)/(6*e^6*(d + e*x)^2) - (5*b*n)/(6*e^6*
(d + e*x)) + (x^6*(a + b*Log[c*x^n]))/(6*d*(d + e*x)^6) - (b*n*Log[d + e*x]
)/(6*d*e^6)
```

Rule 43

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

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x^5(a+b\log(cx^n))}{(d+ex)^7}dx &= \frac{x^6(a+b\log(cx^n))}{6d(d+ex)^6}-\frac{(bn)\int \frac{x^5}{(d+ex)^6}dx}{6d}\\ &= \frac{x^6(a+b\log(cx^n))}{6d(d+ex)^6}-\frac{(bn)\int \left(-\frac{d^5}{e^5(d+ex)^6}+\frac{5d^4}{e^5(d+ex)^5}-\frac{10d^3}{e^5(d+ex)^4}+\frac{10d^2}{e^5(d+ex)^3}-\frac{5d}{e^5(d+ex)^2}\right.}{6d}\\ &= -\frac{bd^4n}{30e^6(d+ex)^5}+\frac{5bd^3n}{24e^6(d+ex)^4}-\frac{5bd^2n}{9e^6(d+ex)^3}+\frac{5bdn}{6e^6(d+ex)^2}-\frac{5bn}{6e^6(d+ex)}+\frac{x}{-}\end{aligned}$$

Mathematica [B] time = 0.29, size = 335, normalized size = 2.46

$$-\frac{60ad^6+360ad^5ex+900ad^4e^2x^2+1200ad^3e^3x^3+900ad^2e^4x^4+360ade^5x^5+60bd\left(d^5+6d^4ex+15d^3e^2x^2+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -1/360*(60*a*d^6 + 137*b*d^6*n + 360*a*d^5*e*x + 762*b*d^5*e*n*x + 900*a*d^
4*e^2*x^2 + 1725*b*d^4*e^2*n*x^2 + 1200*a*d^3*e^3*x^3 + 2000*b*d^3*e^3*n*x^
3 + 900*a*d^2*e^4*x^4 + 1200*b*d^2*e^4*n*x^4 + 360*a*d*e^5*x^5 + 300*b*d*e^
5*n*x^5 - 60*b*n*(d + e*x)^6*Log[x] + 60*b*d*(d^5 + 6*d^4*e*x + 15*d^3*e^2*
x^2 + 20*d^2*e^3*x^3 + 15*d*e^4*x^4 + 6*e^5*x^5)*Log[c*x^n] + 60*b*d^6*n*Lo
g[d + e*x] + 360*b*d^5*e*n*x*Log[d + e*x] + 900*b*d^4*e^2*n*x^2*Log[d + e*x
] + 1200*b*d^3*e^3*n*x^3*Log[d + e*x] + 900*b*d^2*e^4*n*x^4*Log[d + e*x] +
360*b*d*e^5*n*x^5*Log[d + e*x] + 60*b*e^6*n*x^6*Log[d + e*x])/(d*e^6*(d + e
*x)^6)
```

fricas [B] time = 0.78, size = 361, normalized size = 2.65

$$\frac{60\,be^6nx^6\log(x) - 137\,bd^6n - 60\,ad^6 - 60\left(5\,bde^5n + 6\,ade^5\right)x^5 - 300\left(4\,bd^2e^4n + 3\,ad^2e^4\right)x^4 - 400\left(5\,bd^3e^3n + 3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] 1/360*(60*b*e^6*n*x^6*log(x) - 137*b*d^6*n - 60*a*d^6 - 60*(5*b*d*e^5*n + 6
*a*d*e^5)*x^5 - 300*(4*b*d^2*e^4*n + 3*a*d^2*e^4)*x^4 - 400*(5*b*d^3*e^3*n
+ 3*a*d^3*e^3)*x^3 - 75*(23*b*d^4*e^2*n + 12*a*d^4*e^2)*x^2 - 6*(127*b*d^5*
e*n + 60*a*d^5*e)*x - 60*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^
4 + 20*b*d^3*e^3*n*x^3 + 15*b*d^4*e^2*n*x^2 + 6*b*d^5*e*n*x + b*d^6*n)*log(
e*x + d) - 60*(6*b*d*e^5*x^5 + 15*b*d^2*e^4*x^4 + 20*b*d^3*e^3*x^3 + 15*b*d
^4*e^2*x^2 + 6*b*d^5*e*x + b*d^6)*log(c))/(d*e^12*x^6 + 6*d^2*e^11*x^5 + 15
*d^3*e^10*x^4 + 20*d^4*e^9*x^3 + 15*d^5*e^8*x^2 + 6*d^6*e^7*x + d^7*e^6)
```

giac [B] time = 0.31, size = 388, normalized size = 2.85

$$-\frac{60\,bnx^6e^6\log\left(xe+d\right) + 360\,bdnx^5e^5\log\left(xe+d\right) + 900\,bd^2nx^4e^4\log\left(xe+d\right) + 1200\,bd^3nx^3e^3\log\left(xe+d\right) + 9(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] -1/360*(60*b*n*x^6*e^6*log(x*e + d) + 360*b*d*n*x^5*e^5*log(x*e + d) + 900*
b*d^2*n*x^4*e^4*log(x*e + d) + 1200*b*d^3*n*x^3*e^3*log(x*e + d) + 900*b*d^
4*n*x^2*e^2*log(x*e + d) + 360*b*d^5*n*x*e*log(x*e + d) - 60*b*n*x^6*e^6*lo
g(x) + 300*b*d*n*x^5*e^5 + 1200*b*d^2*n*x^4*e^4 + 2000*b*d^3*n*x^3*e^3 + 17
25*b*d^4*n*x^2*e^2 + 762*b*d^5*n*x*e + 60*b*d^6*n*log(x*e + d) + 360*b*d*x^
5*e^5*log(c) + 900*b*d^2*x^4*e^4*log(c) + 1200*b*d^3*x^3*e^3*log(c) + 900*b
*d^4*x^2*e^2*log(c) + 360*b*d^5*x*e*log(c) + 137*b*d^6*n + 360*a*d*x^5*e^5
+ 900*a*d^2*x^4*e^4 + 1200*a*d^3*x^3*e^3 + 900*a*d^4*x^2*e^2 + 360*a*d^5*x*
e + 60*b*d^6*log(c) + 60*a*d^6)/(d*x^6*e^12 + 6*d^2*x^5*e^11 + 15*d^3*x^4*e
^10 + 20*d^4*x^3*e^9 + 15*d^5*x^2*e^8 + 6*d^6*x*e^7 + d^7*e^6)
```

maple [C] time = 0.28, size = 1165, normalized size = 8.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(b*ln(c*x^n)+a)/(e*x+d)^7,x)
```

```
[Out] -1/6*b*(6*e^5*x^5+15*d*e^4*x^4+20*d^2*e^3*x^3+15*d^3*e^2*x^2+6*d^4*e*x+d^5)
/(e*x+d)^6/e^6*ln(x^n)+1/360*(-300*b*d*e^5*n*x^5-1200*b*d^2*e^4*n*x^4-2000*
```

```
b*d^3*e^3*n*x^3-1725*b*d^4*e^2*n*x^2-762*b*d^5*e*n*x-60*ln(e*x+d)*b*d^6*n+6
0*ln(-x)*b*d^6*n-360*a*d*e^5*x^5-900*a*d^2*e^4*x^4-1200*a*d^3*e^3*x^3-900*a
*d^4*e^2*x^2-360*a*d^5*e*x-60*a*d^6-60*ln(c)*b*d^6-137*b*d^6*n+450*I*Pi*b*d
^4*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+180*I*Pi*b*d^5*e*x*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+600*I*Pi*b*d^3*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-600*I*Pi*b*d^3*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-450*I*Pi*b*d^4*
e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-450*I*Pi*b*d^4*e^2*x^2*csgn(I*c*x^n)^2*
csgn(I*c)-180*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^2*csgn(I*c)-60*ln(e*x+d)*b*e^6*n
*x^6+60*ln(-x)*b*e^6*n*x^6-180*I*Pi*b*d^5*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+1
80*I*Pi*b*d*e^5*x^5*csgn(I*c*x^n)^3+450*I*Pi*b*d^2*e^4*x^4*csgn(I*c*x^n)^3+
600*I*Pi*b*d^3*e^3*x^3*csgn(I*c*x^n)^3-180*I*Pi*b*d*e^5*x^5*csgn(I*x^n)*csg
n(I*c*x^n)^2-180*I*Pi*b*d*e^5*x^5*csgn(I*c*x^n)^2*csgn(I*c)-450*I*Pi*b*d^2*
e^4*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-450*I*Pi*b*d^2*e^4*x^4*csgn(I*c*x^n)^2*
csgn(I*c)-600*I*Pi*b*d^3*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+30*I*Pi*b*d^6*
csgn(I*c*x^n)^3-900*ln(c)*b*d^4*e^2*x^2-360*ln(c)*b*d^5*e*x-360*ln(c)*b*d*e
^5*x^5-900*ln(c)*b*d^2*e^4*x^4-1200*ln(c)*b*d^3*e^3*x^3+180*I*Pi*b*d*e^5*x^
5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+450*I*Pi*b*d^2*e^4*x^4*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-30*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)^2-30*I*Pi*b*d
^6*csgn(I*c*x^n)^2*csgn(I*c)-360*ln(e*x+d)*b*d*e^5*n*x^5-900*ln(e*x+d)*b*d^
2*e^4*n*x^4-1200*ln(e*x+d)*b*d^3*e^3*n*x^3-900*ln(e*x+d)*b*d^4*e^2*n*x^2-36
0*ln(e*x+d)*b*d^5*e*n*x+360*ln(-x)*b*d*e^5*n*x^5+900*ln(-x)*b*d^2*e^4*n*x^4
+1200*ln(-x)*b*d^3*e^3*n*x^3+900*ln(-x)*b*d^4*e^2*n*x^2+360*ln(-x)*b*d^5*e*
n*x+450*I*Pi*b*d^4*e^2*x^2*csgn(I*c*x^n)^3+180*I*Pi*b*d^5*e*x*csgn(I*c*x^n)
^3+30*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c))/d/e^6/(e*x+d)^6
```

maxima [B] time = 0.66, size = 377, normalized size = 2.77

$$-\frac{1}{360}bn\left(\frac{300e^4x^4+900de^3x^3+1100d^2e^2x^2+625d^3ex+137d^4}{e^{11}x^5+5de^{10}x^4+10d^2e^9x^3+10d^3e^8x^2+5d^4e^7x+d^5e^6}+\frac{60\log(ex+d)}{de^6}-\frac{60\log(x)}{de^6}\right)-\frac{(6e^5x}{6(e^{12}x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] -1/360*b*n*((300*e^4*x^4 + 900*d*e^3*x^3 + 1100*d^2*e^2*x^2 + 625*d^3*e*x +
 137*d^4)/(e^11*x^5 + 5*d*e^10*x^4 + 10*d^2*e^9*x^3 + 10*d^3*e^8*x^2 + 5*d^
4*e^7*x + d^5*e^6) + 60*log(e*x + d)/(d*e^6) - 60*log(x)/(d*e^6)) - 1/6*(6*
e^5*x^5 + 15*d*e^4*x^4 + 20*d^2*e^3*x^3 + 15*d^3*e^2*x^2 + 6*d^4*e*x + d^5)
*b*log(c*x^n)/(e^12*x^6 + 6*d*e^11*x^5 + 15*d^2*e^10*x^4 + 20*d^3*e^9*x^3 +
 15*d^4*e^8*x^2 + 6*d^5*e^7*x + d^6*e^6) - 1/6*(6*e^5*x^5 + 15*d*e^4*x^4 +
20*d^2*e^3*x^3 + 15*d^3*e^2*x^2 + 6*d^4*e*x + d^5)*a/(e^12*x^6 + 6*d*e^11*x
^5 + 15*d^2*e^10*x^4 + 20*d^3*e^9*x^3 + 15*d^4*e^8*x^2 + 6*d^5*e^7*x + d^6*
e^6)
```

mupad [B] time = 4.48, size = 341, normalized size = 2.51

$$-\frac{x^5\left(6ae^5+5be^5n\right)+x\left(6ad^4e+\frac{127bd^4en}{10}\right)+ad^5+x^3\left(20ad^2e^3+\frac{100bd^2e^3n}{3}\right)+x^2\left(15ad^3e^2+\frac{115bd^3e^2}{4}\right.}{6d^6e^6+36d^5e^7x+90d^4e^8x^2+120d^3e^9x^3+90d^2e^{10}x^4+36de^{11}x^5+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*log(c*x^n)))/(d + e*x)^7,x)
```

```
[Out] - (x^5*(6*a*e^5 + 5*b*e^5*n) + x*(6*a*d^4*e + (127*b*d^4*e*n)/10) + a*d^5 +
 x^3*(20*a*d^2*e^3 + (100*b*d^2*e^3*n)/3) + x^2*(15*a*d^3*e^2 + (115*b*d^3*
e^2*n)/4) + x^4*(15*a*d*e^4 + 20*b*d*e^4*n) + (137*b*d^5*n)/60)/(6*d^6*e^6
+ 6*e^12*x^6 + 36*d^5*e^7*x + 36*d*e^11*x^5 + 90*d^4*e^8*x^2 + 120*d^3*e^9*
x^3 + 90*d^2*e^10*x^4) - (log(c*x^n)*((b*d^5)/(6*e^6) + (b*x^5)/e + (10*b*d
^2*x^3)/(3*e^3) + (5*b*d^3*x^2)/(2*e^4) + (5*b*d*x^4)/(2*e^2) + (b*d^4*x)/e
^5))/(d^6 + e^6*x^6 + 6*d*e^5*x^5 + 15*d^4*e^2*x^2 + 20*d^3*e^3*x^3 + 15*d^
2*e^4*x^4 + 6*d^5*e*x) - (b*n*atanh((2*e*x)/d + 1))/(3*d*e^6)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Timed out
```

3.66 $\int \frac{x^4(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=163

$$\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{30d^2(d+ex)^5}+\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{6d(d+ex)^6}+\frac{bd^2n}{120e^5(d+ex)^4}-\frac{bn\log(d+ex)}{30d^2e^5}-\frac{bnx^5}{30d^2(d+ex)^5}-\frac{2bn}{15de^5(d+ex)}+\frac{}{10e}$$

```
[Out] -1/30*b*n*x^5/d^2/(e*x+d)^5+1/120*b*d^2*n/e^5/(e*x+d)^4-2/45*b*d*n/e^5/(e*x
+d)^3+1/10*b*n/e^5/(e*x+d)^2-2/15*b*n/d/e^5/(e*x+d)+1/6*x^5*(a+b*ln(c*x^n))
/d/(e*x+d)^6+1/30*x^5*(a+b*ln(c*x^n))/d^2/(e*x+d)^5-1/30*b*n*ln(e*x+d)/d^2/
e^5
```

Rubi [A] time = 0.13, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {45, 37, 2350, 12, 78, 43}

$$\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{30d^2(d+ex)^5}+\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{6d(d+ex)^6}+\frac{bd^2n}{120e^5(d+ex)^4}-\frac{bn\log(d+ex)}{30d^2e^5}-\frac{bnx^5}{30d^2(d+ex)^5}-\frac{2bn}{15de^5(d+ex)}+\frac{}{10e}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -(b*n*x^5)/(30*d^2*(d + e*x)^5) + (b*d^2*n)/(120*e^5*(d + e*x)^4) - (2*b*d*
n)/(45*e^5*(d + e*x)^3) + (b*n)/(10*e^5*(d + e*x)^2) - (2*b*n)/(15*d*e^5*(d
 + e*x)) + (x^5*(a + b*Log[c*x^n]))/(6*d*(d + e*x)^6) + (x^5*(a + b*Log[c*x
^n]))/(30*d^2*(d + e*x)^5) - (b*n*Log[d + e*x])/(30*d^2*e^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

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

Rule 43

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

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^4\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^7}\,dx = \frac{x^5\left(a+b\log\left(cx^n\right)\right)}{6d(d+ex)^6}+\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{30d^2(d+ex)^5}-(bn)\int \frac{x^4(6d+ex)}{30d^2(d+ex)^6}\,dx$$

$$= \frac{x^5\left(a+b\log\left(cx^n\right)\right)}{6d(d+ex)^6}+\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{30d^2(d+ex)^5}-\frac{(bn)\int \frac{x^4(6d+ex)}{(d+ex)^6}\,dx}{30d^2}$$

$$= -\frac{bnx^5}{30d^2(d+ex)^5}+\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{6d(d+ex)^6}+\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{30d^2(d+ex)^5}-\frac{(bn)\int \frac{x^4}{(d+ex)^5}\,dx}{30d^2}$$

$$= -\frac{bnx^5}{30d^2(d+ex)^5}+\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{6d(d+ex)^6}+\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{30d^2(d+ex)^5}-\frac{(bn)\int \left(\frac{d^4}{e^4(d+ex)^5}-\frac{}{e^4(}\right.}{}$$

$$= -\frac{bnx^5}{30d^2(d+ex)^5}+\frac{bd^2n}{120e^5(d+ex)^4}-\frac{2bdn}{45e^5(d+ex)^3}+\frac{bn}{10e^5(d+ex)^2}-\frac{2bn}{15de^5(d+ex)}$$

Mathematica [A] time = 0.32, size = 316, normalized size = 1.94

$$-\frac{12ad^6+72ad^5ex+180ad^4e^2x^2+240ad^3e^3x^3+180ad^2e^4x^4+12bd^2\left(d^4+6d^3ex+15d^2e^2x^2+20de^3x^3+15e^4x^4\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -1/360*(12*a*d^6 + 13*b*d^6*n + 72*a*d^5*e*x + 66*b*d^5*e*n*x + 180*a*d^4*e
^2*x^2 + 129*b*d^4*e^2*n*x^2 + 240*a*d^3*e^3*x^3 + 112*b*d^3*e^3*n*x^3 + 18
0*a*d^2*e^4*x^4 + 24*b*d^2*e^4*n*x^4 - 12*b*d*e^5*n*x^5 - 12*b*n*(d + e*x)^
6*Log[x] + 12*b*d^2*(d^4 + 6*d^3*e*x + 15*d^2*e^2*x^2 + 20*d*e^3*x^3 + 15*e
^4*x^4)*Log[c*x^n] + 12*b*d^6*n*Log[d + e*x] + 72*b*d^5*e*n*x*Log[d + e*x]
+ 180*b*d^4*e^2*n*x^2*Log[d + e*x] + 240*b*d^3*e^3*n*x^3*Log[d + e*x] + 180
*b*d^2*e^4*n*x^4*Log[d + e*x] + 72*b*d*e^5*n*x^5*Log[d + e*x] + 12*b*e^6*n*
x^6*Log[d + e*x])/(d^2*e^5*(d + e*x)^6)
```

fricas [B] time = 0.77, size = 356, normalized size = 2.18

$$\frac{12\,bde^5nx^5-13\,bd^6n-12\,ad^6-12\left(2\,bd^2e^4n+15\,ad^2e^4\right)x^4-16\left(7\,bd^3e^3n+15\,ad^3e^3\right)x^3-3\left(43\,bd^4e^2n+60\,ad^4e\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] 1/360*(12*b*d*e^5*n*x^5 - 13*b*d^6*n - 12*a*d^6 - 12*(2*b*d^2*e^4*n + 15*a*
d^2*e^4)*x^4 - 16*(7*b*d^3*e^3*n + 15*a*d^3*e^3)*x^3 - 3*(43*b*d^4*e^2*n +
60*a*d^4*e^2)*x^2 - 6*(11*b*d^5*e*n + 12*a*d^5*e)*x - 12*(b*e^6*n*x^6 + 6*b
*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e^3*n*x^3 + 15*b*d^4*e^2*n*x^2
 + 6*b*d^5*e*n*x + b*d^6*n)*log(e*x + d) - 12*(15*b*d^2*e^4*x^4 + 20*b*d^3*
e^3*x^3 + 15*b*d^4*e^2*x^2 + 6*b*d^5*e*x + b*d^6)*log(c) + 12*(b*e^6*n*x^6
+ 6*b*d*e^5*n*x^5)*log(x))/(d^2*e^11*x^6 + 6*d^3*e^10*x^5 + 15*d^4*e^9*x^4
+ 20*d^5*e^8*x^3 + 15*d^6*e^7*x^2 + 6*d^7*e^6*x + d^8*e^5)
```

giac [B] time = 0.34, size = 382, normalized size = 2.34

$$-\frac{12\,bnx^6e^6\log\left(xe+d\right)+72\,bdnx^5e^5\log\left(xe+d\right)+180\,bd^2nx^4e^4\log\left(xe+d\right)+240\,bd^3nx^3e^3\log\left(xe+d\right)+1\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] -1/360*(12*b*n*x^6*e^6*log(x*e + d) + 72*b*d*n*x^5*e^5*log(x*e + d) + 180*b
*d^2*n*x^4*e^4*log(x*e + d) + 240*b*d^3*n*x^3*e^3*log(x*e + d) + 180*b*d^4*
n*x^2*e^2*log(x*e + d) + 72*b*d^5*n*x*e*log(x*e + d) - 12*b*n*x^6*e^6*log(x
) - 72*b*d*n*x^5*e^5*log(x) - 12*b*d*n*x^5*e^5 + 24*b*d^2*n*x^4*e^4 + 112*b
*d^3*n*x^3*e^3 + 129*b*d^4*n*x^2*e^2 + 66*b*d^5*n*x*e + 12*b*d^6*n*log(x*e
+ d) + 180*b*d^2*x^4*e^4*log(c) + 240*b*d^3*x^3*e^3*log(c) + 180*b*d^4*x^2*
e^2*log(c) + 72*b*d^5*x*e*log(c) + 13*b*d^6*n + 180*a*d^2*x^4*e^4 + 240*a*d
^3*x^3*e^3 + 180*a*d^4*x^2*e^2 + 72*a*d^5*x*e + 12*b*d^6*log(c) + 12*a*d^6)
/(d^2*x^6*e^11 + 6*d^3*x^5*e^10 + 15*d^4*x^4*e^9 + 20*d^5*x^3*e^8 + 15*d^6*
x^2*e^7 + 6*d^7*x*e^6 + d^8*e^5)
```

maple [C] time = 0.27, size = 1022, normalized size = 6.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(b*ln(c*x^n)+a)/(e*x+d)^7,x)
```

```
[Out] -1/30*b*(15*e^4*x^4+20*d*e^3*x^3+15*d^2*e^2*x^2+6*d^3*e*x+d^4)/(e*x+d)^6/e^
5*ln(x^n)-1/360*(-12*b*d*e^5*n*x^5+24*b*d^2*e^4*n*x^4+112*b*d^3*e^3*n*x^3+1
29*b*d^4*e^2*n*x^2+66*b*d^5*e*n*x+12*b*d^6*n*ln(e*x+d)-12*b*d^6*n*ln(-x)+18
0*a*d^2*e^4*x^4+240*a*d^3*e^3*x^3+180*a*d^4*e^2*x^2+72*a*d^5*e*x+12*a*d^6+1
2*b*d^6*ln(c)+13*b*d^6*n+36*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^2*csgn(I*c)+90*I*P
i*b*d^2*e^4*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+90*I*Pi*b*d^4*e^2*x^2*csgn(I*x^
n)*csgn(I*c*x^n)^2+12*b*e^6*n*x^6*ln(e*x+d)-12*b*e^6*n*x^6*ln(-x)+90*I*Pi*b
*d^4*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+36*I*Pi*b*d^5*e*x*csgn(I*x^n)*csgn(I
*c*x^n)^2-90*I*Pi*b*d^2*e^4*x^4*csgn(I*c*x^n)^3+90*I*Pi*b*d^2*e^4*x^4*csgn(
I*c*x^n)^2*csgn(I*c)+120*I*Pi*b*d^3*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+120
*I*Pi*b*d^3*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-90*I*Pi*b*d^2*e^4*x^4*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+180*b*d^4*e^2*x^2*ln(c)+72*b*d^5*e*x*ln(c)+180
*b*d^2*e^4*x^4*ln(c)+240*b*d^3*e^3*x^3*ln(c)-6*I*Pi*b*d^6*csgn(I*c*x^n)^3-3
6*I*Pi*b*d^5*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-120*I*Pi*b*d^3*e^3*x^3
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-90*I*Pi*b*d^4*e^2*x^2*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)+6*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)^2+6*I*Pi*b*d^6*c
sgn(I*c*x^n)^2*csgn(I*c)+72*b*d*e^5*n*x^5*ln(e*x+d)+180*b*d^2*e^4*n*x^4*ln(
e*x+d)+240*b*d^3*e^3*n*x^3*ln(e*x+d)+180*b*d^4*e^2*n*x^2*ln(e*x+d)+72*b*d^5
*e*n*x*ln(e*x+d)-72*b*d*e^5*n*x^5*ln(-x)-180*b*d^2*e^4*n*x^4*ln(-x)-240*b*d
^3*e^3*n*x^3*ln(-x)-180*b*d^4*e^2*n*x^2*ln(-x)-72*b*d^5*e*n*x*ln(-x)-120*I*
Pi*b*d^3*e^3*x^3*csgn(I*c*x^n)^3-90*I*Pi*b*d^4*e^2*x^2*csgn(I*c*x^n)^3-36*I
*Pi*b*d^5*e*x*csgn(I*c*x^n)^3-6*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c))/d^2/e^5/(e*x+d)^6
```

maxima [B] time = 0.76, size = 358, normalized size = 2.20

$$\frac{1}{360}\,bn\left(\frac{12\,e^4x^4-36\,de^3x^3-76\,d^2e^2x^2-53\,d^3ex-13\,d^4}{de^{10}x^5+5\,d^2e^9x^4+10\,d^3e^8x^3+10\,d^4e^7x^2+5\,d^5e^6x+d^6e^5}-\frac{12\,\log\left(ex+d\right)}{d^2e^5}+\frac{12\,\log(x)}{d^2e^5}\right)-\frac{(15}{30\left(e^{11}x^6+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/360*b*n*((12*e^4*x^4 - 36*d*e^3*x^3 - 76*d^2*e^2*x^2 - 53*d^3*e*x - 13*d^
4)/(d*e^10*x^5 + 5*d^2*e^9*x^4 + 10*d^3*e^8*x^3 + 10*d^4*e^7*x^2 + 5*d^5*e^
6*x + d^6*e^5) - 12*log(e*x + d)/(d^2*e^5) + 12*log(x)/(d^2*e^5)) - 1/30*(1
5*e^4*x^4 + 20*d*e^3*x^3 + 15*d^2*e^2*x^2 + 6*d^3*e*x + d^4)*b*log(c*x^n)/(
e^11*x^6 + 6*d*e^10*x^5 + 15*d^2*e^9*x^4 + 20*d^3*e^8*x^3 + 15*d^4*e^7*x^2
+ 6*d^5*e^6*x + d^6*e^5) - 1/30*(15*e^4*x^4 + 20*d*e^3*x^3 + 15*d^2*e^2*x^2
 + 6*d^3*e*x + d^4)*a/(e^11*x^6 + 6*d*e^10*x^5 + 15*d^2*e^9*x^4 + 20*d^3*e^
8*x^3 + 15*d^4*e^7*x^2 + 6*d^5*e^6*x + d^6*e^5)
```

mupad [B] time = 4.26, size = 320, normalized size = 1.96

$$-\frac{x^4\,\left(15\,a\,e^4+2\,b\,e^4\,n\right)+x\,\left(6\,a\,d^3\,e+\frac{11\,b\,d^3\,e\,n}{2}\right)+a\,d^4+x^2\,\left(15\,a\,d^2\,e^2+\frac{43\,b\,d^2\,e^2\,n}{4}\right)+x^3\,\left(20\,a\,d\,e^3+\frac{28\,b\,d\,e^3\,n}{3}\right)+}{30\,d^6\,e^5+180\,d^5\,e^6\,x+450\,d^4\,e^7\,x^2+600\,d^3\,e^8\,x^3+450\,d^2\,e^9\,x^4+180\,d\,e^{10}\,x^5+30\,e^{11}\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*log(c*x^n)))/(d + e*x)^7,x)
```

```
[Out] - (x^4*(15*a*e^4 + 2*b*e^4*n) + x*(6*a*d^3*e + (11*b*d^3*e*n)/2) + a*d^4 +
x^2*(15*a*d^2*e^2 + (43*b*d^2*e^2*n)/4) + x^3*(20*a*d*e^3 + (28*b*d*e^3*n)/
3) + (13*b*d^4*n)/12 - (b*e^5*n*x^5)/d)/(30*d^6*e^5 + 30*e^11*x^6 + 180*d^5
*e^6*x + 180*d*e^10*x^5 + 450*d^4*e^7*x^2 + 600*d^3*e^8*x^3 + 450*d^2*e^9*x
^4) - (log(c*x^n)*((b*d^4)/(30*e^5) + (b*x^4)/(2*e) + (b*d^2*x^2)/(2*e^3) +
 (2*b*d*x^3)/(3*e^2) + (b*d^3*x)/(5*e^4)))/(d^6 + e^6*x^6 + 6*d*e^5*x^5 + 1
5*d^4*e^2*x^2 + 20*d^3*e^3*x^3 + 15*d^2*e^4*x^4 + 6*d^5*e*x) - (b*n*atanh((
2*e*x)/d + 1))/(15*d^2*e^5)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Timed out
```

3.67 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=226

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{6e^4(d+ex)^6}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{5e^4(d+ex)^5}+\frac{3d\left(a+b\log\left(cx^n\right)\right)}{4e^4(d+ex)^4}-\frac{a+b\log\left(cx^n\right)}{3e^4(d+ex)^3}+\frac{bn\log(x)}{60d^3e^4}-\frac{bn\log(d+ex)}{60d^3e^4}-$$

```
[Out] -1/30*b*d^2*n/e^4/(e*x+d)^5+13/120*b*d*n/e^4/(e*x+d)^4-19/180*b*n/e^4/(e*x+
d)^3+1/120*b*n/d/e^4/(e*x+d)^2+1/60*b*n/d^2/e^4/(e*x+d)+1/60*b*n*ln(x)/d^3/
e^4+1/6*d^3*(a+b*ln(c*x^n))/e^4/(e*x+d)^6-3/5*d^2*(a+b*ln(c*x^n))/e^4/(e*x+
d)^5+3/4*d*(a+b*ln(c*x^n))/e^4/(e*x+d)^4+1/3*(-a-b*ln(c*x^n))/e^4/(e*x+d)^3
-1/60*b*n*ln(e*x+d)/d^3/e^4
```

Rubi [A] time = 0.20, antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 2350, 12, 1620}

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{6e^4(d+ex)^6}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{5e^4(d+ex)^5}+\frac{3d\left(a+b\log\left(cx^n\right)\right)}{4e^4(d+ex)^4}-\frac{a+b\log\left(cx^n\right)}{3e^4(d+ex)^3}-\frac{bd^2n}{30e^4(d+ex)^5}+\frac{bn}{60d^2e^4(d+e}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -(b*d^2*n)/(30*e^4*(d + e*x)^5) + (13*b*d*n)/(120*e^4*(d + e*x)^4) - (19*b*
n)/(180*e^4*(d + e*x)^3) + (b*n)/(120*d*e^4*(d + e*x)^2) + (b*n)/(60*d^2*e^
4*(d + e*x)) + (b*n*Log[x])/(60*d^3*e^4) + (d^3*(a + b*Log[c*x^n]))/(6*e^4*
(d + e*x)^6) - (3*d^2*(a + b*Log[c*x^n]))/(5*e^4*(d + e*x)^5) + (3*d*(a + b
*Log[c*x^n]))/(4*e^4*(d + e*x)^4) - (a + b*Log[c*x^n])/(3*e^4*(d + e*x)^3)
- (b*n*Log[d + e*x])/(60*d^3*e^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

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

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^7}\,dx = \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{6e^4(d+ex)^6} - \frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{5e^4(d+ex)^5} + \frac{3d\left(a+b\log\left(cx^n\right)\right)}{4e^4(d+ex)^4} - \frac{a+b\log\left(cx^n\right)}{3e^4(d+ex)^3}$$

$$= \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{6e^4(d+ex)^6} - \frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{5e^4(d+ex)^5} + \frac{3d\left(a+b\log\left(cx^n\right)\right)}{4e^4(d+ex)^4} - \frac{a+b\log\left(cx^n\right)}{3e^4(d+ex)^3}$$

$$= \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{6e^4(d+ex)^6} - \frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{5e^4(d+ex)^5} + \frac{3d\left(a+b\log\left(cx^n\right)\right)}{4e^4(d+ex)^4} - \frac{a+b\log\left(cx^n\right)}{3e^4(d+ex)^3}$$

$$= -\frac{bd^2n}{30e^4(d+ex)^5} + \frac{13bdn}{120e^4(d+ex)^4} - \frac{19bn}{180e^4(d+ex)^3} + \frac{bn}{120de^4(d+ex)^2} + \frac{bn}{60d^2e^4(d+}$$

Mathematica [A] time = 0.24, size = 281, normalized size = 1.24

$$\frac{ad^3}{6e^4(d+ex)^6} - \frac{3ad^2}{5e^4(d+ex)^5} + \frac{3ad}{4e^4(d+ex)^4} - \frac{a}{3e^4(d+ex)^3} + \frac{bd^3\log\left(cx^n\right)}{6e^4(d+ex)^6} - \frac{3bd^2\log\left(cx^n\right)}{5e^4(d+ex)^5} + \frac{3bd\log\left(cx^n\right)}{4e^4(d+ex)^4} - \frac{b\log\left(cx\right.}{3e^4(d+ex}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (a*d^3)/(6*e^4*(d + e*x)^6) - (3*a*d^2)/(5*e^4*(d + e*x)^5) - (b*d^2*n)/(30
*e^4*(d + e*x)^5) + (3*a*d)/(4*e^4*(d + e*x)^4) + (13*b*d*n)/(120*e^4*(d +
e*x)^4) - a/(3*e^4*(d + e*x)^3) - (19*b*n)/(180*e^4*(d + e*x)^3) + (b*n)/(1
20*d*e^4*(d + e*x)^2) + (b*n)/(60*d^2*e^4*(d + e*x)) + (b*n*Log[x])/(60*d^3
*e^4) + (b*d^3*Log[c*x^n])/(6*e^4*(d + e*x)^6) - (3*b*d^2*Log[c*x^n])/(5*e^
4*(d + e*x)^5) + (3*b*d*Log[c*x^n])/(4*e^4*(d + e*x)^4) - (b*Log[c*x^n])/(3
*e^4*(d + e*x)^3) - (b*n*Log[d + e*x])/(60*d^3*e^4)
```

fricas [A] time = 0.54, size = 343, normalized size = 1.52

$$\frac{6\,bde^5nx^5 + 33\,bd^2e^4nx^4 - 2\,bd^6n - 6\,ad^6 + 2\left(17\,bd^3e^3n - 60\,ad^3e^3\right)x^3 + 3\left(bd^4e^2n - 30\,ad^4e^2\right)x^2 - 6\left(bd^5en + 6\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] 1/360*(6*b*d*e^5*n*x^5 + 33*b*d^2*e^4*n*x^4 - 2*b*d^6*n - 6*a*d^6 + 2*(17*b
*d^3*e^3*n - 60*a*d^3*e^3)*x^3 + 3*(b*d^4*e^2*n - 30*a*d^4*e^2)*x^2 - 6*(b*
d^5*e*n + 6*a*d^5*e)*x - 6*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*
x^4 + 20*b*d^3*e^3*n*x^3 + 15*b*d^4*e^2*n*x^2 + 6*b*d^5*e*n*x + b*d^6*n)*lo
g(e*x + d) - 6*(20*b*d^3*e^3*x^3 + 15*b*d^4*e^2*x^2 + 6*b*d^5*e*x + b*d^6)*
log(c) + 6*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4)*log(x))/(d^
3*e^10*x^6 + 6*d^4*e^9*x^5 + 15*d^5*e^8*x^4 + 20*d^6*e^7*x^3 + 15*d^7*e^6*x
^2 + 6*d^8*e^5*x + d^9*e^4)
```

giac [A] time = 0.36, size = 372, normalized size = 1.65

$$-\frac{6\,bnx^6e^6\log\left(xe+d\right) + 36\,bdnx^5e^5\log\left(xe+d\right) + 90\,bd^2nx^4e^4\log\left(xe+d\right) + 120\,bd^3nx^3e^3\log\left(xe+d\right) + 90\,bd^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] -1/360*(6*b*n*x^6*e^6*log(x*e + d) + 36*b*d*n*x^5*e^5*log(x*e + d) + 90*b*d
^2*n*x^4*e^4*log(x*e + d) + 120*b*d^3*n*x^3*e^3*log(x*e + d) + 90*b*d^4*n*x
^2*e^2*log(x*e + d) + 36*b*d^5*n*x*e*log(x*e + d) - 6*b*n*x^6*e^6*log(x) -
36*b*d*n*x^5*e^5*log(x) - 90*b*d^2*n*x^4*e^4*log(x) - 6*b*d*n*x^5*e^5 - 33*
b*d^2*n*x^4*e^4 - 34*b*d^3*n*x^3*e^3 - 3*b*d^4*n*x^2*e^2 + 6*b*d^5*n*x*e +
6*b*d^6*n*log(x*e + d) + 120*b*d^3*x^3*e^3*log(c) + 90*b*d^4*x^2*e^2*log(c)
 + 36*b*d^5*x*e*log(c) + 2*b*d^6*n + 120*a*d^3*x^3*e^3 + 90*a*d^4*x^2*e^2 +
 36*a*d^5*x*e + 6*b*d^6*log(c) + 6*a*d^6)/(d^3*x^6*e^10 + 6*d^4*x^5*e^9 + 1
5*d^5*x^4*e^8 + 20*d^6*x^3*e^7 + 15*d^7*x^2*e^6 + 6*d^8*x*e^5 + d^9*e^4)
```

maple [C] time = 0.29, size = 867, normalized size = 3.84

$$-\frac{\left(20e^3x^3+15d\,e^2x^2+6d^2ex+d^3\right)b\ln\left(x^n\right)}{60\left(ex+d\right)^6e^4}-\frac{-3i\pi b\,d^6\mathrm{csgn}\left(ic\,x^n\right)^3-6bd\,e^5n\,x^5-33b\,d^2e^4n\,x^4-34b\,d^3e^3n\,x^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(e*x+d)^7,x)
```

```
[Out] -1/60*b*(20*e^3*x^3+15*d*e^2*x^2+6*d^2*e*x+d^3)/(e*x+d)^6/e^4*ln(x^n)-1/360
*(45*I*Pi*b*d^4*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-6*b*d*e^5*n*x^5-33*b*d^
2*e^4*n*x^4-34*b*d^3*e^3*n*x^3-3*b*d^4*e^2*n*x^2+6*b*d^5*e*n*x+6*b*d^6*n*ln
(e*x+d)-6*b*d^6*n*ln(-x)+120*a*d^3*e^3*x^3+90*a*d^4*e^2*x^2+36*a*d^5*e*x+60
*I*Pi*b*d^3*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)+6*a*d^6+6*b*d^6*ln(c)+2*b*d^6
*n+45*I*Pi*b*d^4*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+18*I*Pi*b*d^5*e*x*csgn(I
*x^n)*csgn(I*c*x^n)^2+18*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^2*csgn(I*c)+60*I*Pi*b
*d^3*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+6*b*e^6*n*x^6*ln(e*x+d)-6*b*e^6*n*
x^6*ln(-x)-45*I*Pi*b*d^4*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*I*P
i*b*d^5*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-60*I*Pi*b*d^3*e^3*x^3*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b*d^6*csgn(I*c*x^n)^3+90*b*d^4*e^2*x^
2*ln(c)+36*b*d^5*e*x*ln(c)+120*b*d^3*e^3*x^3*ln(c)+3*I*Pi*b*d^6*csgn(I*x^n)
*csgn(I*c*x^n)^2+3*I*Pi*b*d^6*csgn(I*c*x^n)^2*csgn(I*c)+36*b*d*e^5*n*x^5*ln
(e*x+d)+90*b*d^2*e^4*n*x^4*ln(e*x+d)+120*b*d^3*e^3*n*x^3*ln(e*x+d)+90*b*d^4
*e^2*n*x^2*ln(e*x+d)+36*b*d^5*e*n*x*ln(e*x+d)-36*b*d*e^5*n*x^5*ln(-x)-90*b*
d^2*e^4*n*x^4*ln(-x)-120*b*d^3*e^3*n*x^3*ln(-x)-90*b*d^4*e^2*n*x^2*ln(-x)-3
6*b*d^5*e*n*x*ln(-x)-60*I*Pi*b*d^3*e^3*x^3*csgn(I*c*x^n)^3-45*I*Pi*b*d^4*e^
2*x^2*csgn(I*c*x^n)^3-18*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^3-3*I*Pi*b*d^6*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c))/e^4/d^3/(e*x+d)^6
```

maxima [A] time = 0.87, size = 338, normalized size = 1.50

$$\frac{1}{360}bn\left(\frac{6\,e^4x^4+27\,de^3x^3+7\,d^2e^2x^2-4\,d^3ex-2\,d^4}{d^2e^9x^5+5\,d^3e^8x^4+10\,d^4e^7x^3+10\,d^5e^6x^2+5\,d^6e^5x+d^7e^4}-\frac{6\,\log\left(ex+d\right)}{d^3e^4}+\frac{6\,\log(x)}{d^3e^4}\right)-\frac{}{60\left(e^{10}x^6+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/360*b*n*((6*e^4*x^4 + 27*d*e^3*x^3 + 7*d^2*e^2*x^2 - 4*d^3*e*x - 2*d^4)/(
d^2*e^9*x^5 + 5*d^3*e^8*x^4 + 10*d^4*e^7*x^3 + 10*d^5*e^6*x^2 + 5*d^6*e^5*x
 + d^7*e^4) - 6*log(e*x + d)/(d^3*e^4) + 6*log(x)/(d^3*e^4)) - 1/60*(20*e^3
*x^3 + 15*d*e^2*x^2 + 6*d^2*e*x + d^3)*b*log(c*x^n)/(e^10*x^6 + 6*d*e^9*x^5
 + 15*d^2*e^8*x^4 + 20*d^3*e^7*x^3 + 15*d^4*e^6*x^2 + 6*d^5*e^5*x + d^6*e^4
) - 1/60*(20*e^3*x^3 + 15*d*e^2*x^2 + 6*d^2*e*x + d^3)*a/(e^10*x^6 + 6*d*e^
9*x^5 + 15*d^2*e^8*x^4 + 20*d^3*e^7*x^3 + 15*d^4*e^6*x^2 + 6*d^5*e^5*x + d^
6*e^4)
```

mupad [B] time = 4.23, size = 296, normalized size = 1.31

$$-\frac{x^3\,\left(20\,a\,e^3-\frac{17\,b\,e^3\,n}{3}\right)+x\,\left(6\,a\,d^2\,e+b\,d^2\,e\,n\right)+a\,d^3+x^2\,\left(15\,a\,d\,e^2-\frac{b\,d\,e^2\,n}{2}\right)+\frac{b\,d^3\,n}{3}-\frac{11\,b\,e^4\,n\,x^4}{2\,d}-\frac{b\,e^5\,n\,x^5}{d^2}}{60\,d^6\,e^4+360\,d^5\,e^5\,x+900\,d^4\,e^6\,x^2+1200\,d^3\,e^7\,x^3+900\,d^2\,e^8\,x^4+360\,d\,e^9\,x^5+60\,e^{10}\,x^6}-\frac{}{d^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x)^7,x)
```

```
[Out] - (x^3*(20*a*e^3 - (17*b*e^3*n)/3) + x*(6*a*d^2*e + b*d^2*e*n) + a*d^3 + x^
2*(15*a*d*e^2 - (b*d*e^2*n)/2) + (b*d^3*n)/3 - (11*b*e^4*n*x^4)/(2*d) - (b*
e^5*n*x^5)/d^2)/(60*d^6*e^4 + 60*e^10*x^6 + 360*d^5*e^5*x + 360*d*e^9*x^5 +
 900*d^4*e^6*x^2 + 1200*d^3*e^7*x^3 + 900*d^2*e^8*x^4) - (log(c*x^n)*((b*d^
3)/(60*e^4) + (b*x^3)/(3*e) + (b*d*x^2)/(4*e^2) + (b*d^2*x)/(10*e^3)))/(d^6
 + e^6*x^6 + 6*d*e^5*x^5 + 15*d^4*e^2*x^2 + 20*d^3*e^3*x^3 + 15*d^2*e^4*x^4
 + 6*d^5*e*x) - (b*n*atanh((2*e*x)/d + 1))/(30*d^3*e^4)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Timed out
```

3.68 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=199

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{6e^3(d+ex)^6}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{5e^3(d+ex)^5}-\frac{a+b\log\left(cx^n\right)}{4e^3(d+ex)^4}+\frac{bn\log(x)}{60d^4e^3}-\frac{bn\log(d+ex)}{60d^4e^3}+\frac{bn}{60d^3e^3(d+ex)}+\frac{}{120}$$

```
[Out] 1/30*b*d*n/e^3/(e*x+d)^5-7/120*b*n/e^3/(e*x+d)^4+1/180*b*n/d/e^3/(e*x+d)^3+
1/120*b*n/d^2/e^3/(e*x+d)^2+1/60*b*n/d^3/e^3/(e*x+d)+1/60*b*n*ln(x)/d^4/e^3
-1/6*d^2*(a+b*ln(c*x^n))/e^3/(e*x+d)^6+2/5*d*(a+b*ln(c*x^n))/e^3/(e*x+d)^5+
1/4*(-a-b*ln(c*x^n))/e^3/(e*x+d)^4-1/60*b*n*ln(e*x+d)/d^4/e^3
```

Rubi [A] time = 0.16, antiderivative size = 199, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {43, 2350, 12, 893}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{6e^3(d+ex)^6}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{5e^3(d+ex)^5}-\frac{a+b\log\left(cx^n\right)}{4e^3(d+ex)^4}+\frac{bn}{120d^2e^3(d+ex)^2}+\frac{bn}{60d^3e^3(d+ex)}+\frac{bn\log(x)}{60d^4e^3}-\frac{b}{}$$

Antiderivative was successfully verified.

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

```
[Out] (b*d*n)/(30*e^3*(d + e*x)^5) - (7*b*n)/(120*e^3*(d + e*x)^4) + (b*n)/(180*d
*e^3*(d + e*x)^3) + (b*n)/(120*d^2*e^3*(d + e*x)^2) + (b*n)/(60*d^3*e^3*(d
+ e*x)) + (b*n*Log[x])/(60*d^4*e^3) - (d^2*(a + b*Log[c*x^n]))/(6*e^3*(d +
e*x)^6) + (2*d*(a + b*Log[c*x^n]))/(5*e^3*(d + e*x)^5) - (a + b*Log[c*x^n])
/(4*e^3*(d + e*x)^4) - (b*n*Log[d + e*x])/(60*d^4*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

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

Rule 893

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^2 \left(a+b\log\left(cx^n\right)\right)}{(d+ex)^7}\,dx = -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{6e^3(d+ex)^6}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{5e^3(d+ex)^5}-\frac{a+b\log\left(cx^n\right)}{4e^3(d+ex)^4}-(bn)\int \frac{-d^2-6dex-}{60e^3x(d+}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{6e^3(d+ex)^6}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{5e^3(d+ex)^5}-\frac{a+b\log\left(cx^n\right)}{4e^3(d+ex)^4}-\frac{(bn)\int \frac{-d^2-6dex-15e^2x^2}{x(d+ex)^6}}{60e^3}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{6e^3(d+ex)^6}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{5e^3(d+ex)^5}-\frac{a+b\log\left(cx^n\right)}{4e^3(d+ex)^4}-\frac{(bn)\int \left(-\frac{1}{d^4x}+\frac{10de}{(d+ex)}\right.}{}$$

$$= \frac{bdn}{30e^3(d+ex)^5}-\frac{7bn}{120e^3(d+ex)^4}+\frac{bn}{180de^3(d+ex)^3}+\frac{bn}{120d^2e^3(d+ex)^2}+\frac{bn}{60d^3e^3(d+}$$

Mathematica [**A**] time = 0.21, size = 192, normalized size = 0.96

$$\frac{-60ad^6+144ad^5(d+ex)-90ad^4(d+ex)^2-60bd^6\log\left(cx^n\right)+144bd^5(d+ex)\log\left(cx^n\right)-90bd^4(d+ex)^2\log\left(cx\right.}{}$$

Antiderivative was successfully verified.

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

```
[Out] (-60*a*d^6 + 144*a*d^5*(d + e*x) + 12*b*d^5*n*(d + e*x) - 90*a*d^4*(d + e*x
)^2 - 21*b*d^4*n*(d + e*x)^2 + 2*b*d^3*n*(d + e*x)^3 + 3*b*d^2*n*(d + e*x)^
4 + 6*b*d*n*(d + e*x)^5 + 6*b*n*(d + e*x)^6*Log[x] - 60*b*d^6*Log[c*x^n] +
144*b*d^5*(d + e*x)*Log[c*x^n] - 90*b*d^4*(d + e*x)^2*Log[c*x^n] - 6*b*n*(d
 + e*x)^6*Log[d + e*x])/(360*d^4*e^3*(d + e*x)^6)
```

fricas [**A**] time = 0.76, size = 333, normalized size = 1.67

$$\frac{6\,bde^5nx^5+33\,bd^2e^4nx^4+74\,bd^3e^3nx^3+2\,bd^6n-6\,ad^6+9\left(7\,bd^4e^2n-10\,ad^4e^2\right)x^2+18\left(bd^5en-2\,ad^5e\right)x-6\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/360*(6*b*d*e^5*n*x^5 + 33*b*d^2*e^4*n*x^4 + 74*b*d^3*e^3*n*x^3 + 2*b*d^6*
n - 6*a*d^6 + 9*(7*b*d^4*e^2*n - 10*a*d^4*e^2)*x^2 + 18*(b*d^5*e*n - 2*a*d^
5*e)*x - 6*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e
^3*n*x^3 + 15*b*d^4*e^2*n*x^2 + 6*b*d^5*e*n*x + b*d^6*n)*log(e*x + d) - 6*(
15*b*d^4*e^2*x^2 + 6*b*d^5*e*x + b*d^6)*log(c) + 6*(b*e^6*n*x^6 + 6*b*d*e^5
*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e^3*n*x^3)*log(x))/(d^4*e^9*x^6 + 6*
d^5*e^8*x^5 + 15*d^6*e^7*x^4 + 20*d^7*e^6*x^3 + 15*d^8*e^5*x^2 + 6*d^9*e^4*
x + d^10*e^3)
```

giac [**B**] time = 0.34, size = 362, normalized size = 1.82

$$-\frac{6\,bnx^6e^6\log\left(xe+d\right)+36\,bdnx^5e^5\log\left(xe+d\right)+90\,bd^2nx^4e^4\log\left(xe+d\right)+120\,bd^3nx^3e^3\log\left(xe+d\right)+90\,bd^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/360*(6*b*n*x^6*e^6*log(x*e + d) + 36*b*d*n*x^5*e^5*log(x*e + d) + 90*b*d
^2*n*x^4*e^4*log(x*e + d) + 120*b*d^3*n*x^3*e^3*log(x*e + d) + 90*b*d^4*n*x
```

```
^2*e^2*log(x*e + d) + 36*b*d^5*n*x*e*log(x*e + d) - 6*b*n*x^6*e^6*log(x) -
36*b*d*n*x^5*e^5*log(x) - 90*b*d^2*n*x^4*e^4*log(x) - 120*b*d^3*n*x^3*e^3*l
og(x) - 6*b*d*n*x^5*e^5 - 33*b*d^2*n*x^4*e^4 - 74*b*d^3*n*x^3*e^3 - 63*b*d^
4*n*x^2*e^2 - 18*b*d^5*n*x*e + 6*b*d^6*n*log(x*e + d) + 90*b*d^4*x^2*e^2*lo
g(c) + 36*b*d^5*x*e*log(c) - 2*b*d^6*n + 90*a*d^4*x^2*e^2 + 36*a*d^5*x*e +
6*b*d^6*log(c) + 6*a*d^6)/(d^4*x^6*e^9 + 6*d^5*x^5*e^8 + 15*d^6*x^4*e^7 + 2
0*d^7*x^3*e^6 + 15*d^8*x^2*e^5 + 6*d^9*x*e^4 + d^10*e^3)
```

maple [C] time = 0.27, size = 712, normalized size = 3.58

$$-\frac{\left(15e^2x^2+6dex+d^2\right)b\ln\left(x^n\right)}{60\left(ex+d\right)^6e^3}+\frac{3i\pi b\,d^6\mathrm{csgn}\left(ic\,x^n\right)^3+6bd\,e^5n\,x^5+33b\,d^2e^4n\,x^4+74b\,d^3e^3n\,x^3+63b\,d^4e^2n\,}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/60*b*(15*e^2*x^2+6*d*e*x+d^2)/(e*x+d)^6/e^3*ln(x^n)+1/360*(6*b*d*e^5*n*x
^5+33*b*d^2*e^4*n*x^4+74*b*d^3*e^3*n*x^3+63*b*d^4*e^2*n*x^2+18*b*d^5*e*n*x-
6*b*d^6*n*ln(e*x+d)+6*b*d^6*n*ln(-x)-90*a*d^4*e^2*x^2-36*a*d^5*e*x-6*a*d^6-
6*b*d^6*ln(c)+2*b*d^6*n-45*I*Pi*b*d^4*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+45*
I*Pi*b*d^4*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+18*I*Pi*b*d^5*e*x*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3*I*Pi*b*d^6*csgn(I*c*x^n)^3-6*b*e^6*n*x^
6*ln(e*x+d)+6*b*e^6*n*x^6*ln(-x)-18*I*Pi*b*d^5*e*x*csgn(I*x^n)*csgn(I*c*x^n
)^2-18*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^2*csgn(I*c)-45*I*Pi*b*d^4*e^2*x^2*csgn(
I*x^n)*csgn(I*c*x^n)^2-90*b*d^4*e^2*x^2*ln(c)-36*b*d^5*e*x*ln(c)+45*I*Pi*b*
d^4*e^2*x^2*csgn(I*c*x^n)^3-3*I*Pi*b*d^6*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b
*d^6*csgn(I*x^n)*csgn(I*c*x^n)^2+18*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^3+3*I*Pi*b
*d^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-36*b*d*e^5*n*x^5*ln(e*x+d)-90*b*d^
2*e^4*n*x^4*ln(e*x+d)-120*b*d^3*e^3*n*x^3*ln(e*x+d)-90*b*d^4*e^2*n*x^2*ln(e
*x+d)-36*b*d^5*e*n*x*ln(e*x+d)+36*b*d*e^5*n*x^5*ln(-x)+90*b*d^2*e^4*n*x^4*l
n(-x)+120*b*d^3*e^3*n*x^3*ln(-x)+90*b*d^4*e^2*n*x^2*ln(-x)+36*b*d^5*e*n*x*l
n(-x))/d^4/e^3/(e*x+d)^6
```

maxima [A] time = 0.67, size = 316, normalized size = 1.59

$$\frac{1}{360}bn\left(\frac{6e^4x^4+27de^3x^3+47d^2e^2x^2+16d^3ex+2d^4}{d^3e^8x^5+5d^4e^7x^4+10d^5e^6x^3+10d^6e^5x^2+5d^7e^4x+d^8e^3}-\frac{6\log\left(ex+d\right)}{d^4e^3}+\frac{6\log(x)}{d^4e^3}\right)-\frac{}{60\left(e^9x^6+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/360*b*n*((6*e^4*x^4 + 27*d*e^3*x^3 + 47*d^2*e^2*x^2 + 16*d^3*e*x + 2*d^4)
/(d^3*e^8*x^5 + 5*d^4*e^7*x^4 + 10*d^5*e^6*x^3 + 10*d^6*e^5*x^2 + 5*d^7*e^4
*x + d^8*e^3) - 6*log(e*x + d)/(d^4*e^3) + 6*log(x)/(d^4*e^3)) - 1/60*(15*e
^2*x^2 + 6*d*e*x + d^2)*b*log(c*x^n)/(e^9*x^6 + 6*d*e^8*x^5 + 15*d^2*e^7*x^
4 + 20*d^3*e^6*x^3 + 15*d^4*e^5*x^2 + 6*d^5*e^4*x + d^6*e^3) - 1/60*(15*e^2
*x^2 + 6*d*e*x + d^2)*a/(e^9*x^6 + 6*d*e^8*x^5 + 15*d^2*e^7*x^4 + 20*d^3*e^
6*x^3 + 15*d^4*e^5*x^2 + 6*d^5*e^4*x + d^6*e^3)
```

mupad [B] time = 3.93, size = 275, normalized size = 1.38

$$\frac{\frac{b\,d^2\,n}{3}-a\,d^2-x\,\left(6\,a\,d\,e-3\,b\,d\,e\,n\right)-x^2\,\left(15\,a\,e^2-\frac{21\,b\,e^2\,n}{2}\right)+\frac{37\,b\,e^3\,n\,x^3}{3\,d}+\frac{11\,b\,e^4\,n\,x^4}{2\,d^2}+\frac{b\,e^5\,n\,x^5}{d^3}}{60\,d^6\,e^3+360\,d^5\,e^4\,x+900\,d^4\,e^5\,x^2+1200\,d^3\,e^6\,x^3+900\,d^2\,e^7\,x^4+360\,d\,e^8\,x^5+60\,e^9\,x^6}-\frac{}{d^6+6\,d^5\,e\,x+15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((b*d^2*n)/3 - a*d^2 - x*(6*a*d*e - 3*b*d*e*n) - x^2*(15*a*e^2 - (21*b*e^2*
n)/2) + (37*b*e^3*n*x^3)/(3*d) + (11*b*e^4*n*x^4)/(2*d^2) + (b*e^5*n*x^5)/d
^3)/(60*d^6*e^3 + 60*e^9*x^6 + 360*d^5*e^4*x + 360*d*e^8*x^5 + 900*d^4*e^5*
x^2 + 1200*d^3*e^6*x^3 + 900*d^2*e^7*x^4) - (log(c*x^n)*((b*d^2)/(60*e^3) +
 (b*x^2)/(4*e) + (b*d*x)/(10*e^2)))/(d^6 + e^6*x^6 + 6*d*e^5*x^5 + 15*d^4*e
^2*x^2 + 20*d^3*e^3*x^3 + 15*d^2*e^4*x^4 + 6*d^5*e*x) - (b*n*atanh((2*e*x)/
d + 1))/(30*d^4*e^3)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.69 $\int \frac{x\left(a+b\log(cx^n)\right)}{(d+ex)^7}\,dx$

Optimal. Leaf size=174

$$-\frac{a+b\log(cx^n)}{5e^2(d+ex)^5}+\frac{d\left(a+b\log(cx^n)\right)}{6e^2(d+ex)^6}+\frac{bn\log(x)}{30d^5e^2}-\frac{bn\log(d+ex)}{30d^5e^2}+\frac{bn}{30d^4e^2(d+ex)}+\frac{bn}{60d^3e^2(d+ex)^2}+\frac{bn}{90d^2e^2(d}$$

```
[Out] -1/30*b*n/e^2/(e*x+d)^5+1/120*b*n/d/e^2/(e*x+d)^4+1/90*b*n/d^2/e^2/(e*x+d)^
3+1/60*b*n/d^3/e^2/(e*x+d)^2+1/30*b*n/d^4/e^2/(e*x+d)+1/30*b*n*ln(x)/d^5/e^
2+1/6*d*(a+b*ln(c*x^n))/e^2/(e*x+d)^6+1/5*(-a-b*ln(c*x^n))/e^2/(e*x+d)^5-1/
30*b*n*ln(e*x+d)/d^5/e^2
```

Rubi [A] time = 0.12, antiderivative size = 174, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {43, 2350, 12, 77}

$$-\frac{a+b\log(cx^n)}{5e^2(d+ex)^5}+\frac{d\left(a+b\log(cx^n)\right)}{6e^2(d+ex)^6}+\frac{bn}{30d^4e^2(d+ex)}+\frac{bn}{60d^3e^2(d+ex)^2}+\frac{bn}{90d^2e^2(d+ex)^3}+\frac{bn\log(x)}{30d^5e^2}-\frac{bn\log(}{30d}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -(b*n)/(30*e^2*(d + e*x)^5) + (b*n)/(120*d*e^2*(d + e*x)^4) + (b*n)/(90*d^2
*e^2*(d + e*x)^3) + (b*n)/(60*d^3*e^2*(d + e*x)^2) + (b*n)/(30*d^4*e^2*(d +
 e*x)) + (b*n*Log[x])/(30*d^5*e^2) + (d*(a + b*Log[c*x^n]))/(6*e^2*(d + e*x
)^6) - (a + b*Log[c*x^n])/(5*e^2*(d + e*x)^5) - (b*n*Log[d + e*x])/(30*d^5*
e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

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

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^7}\,dx = \frac{d\left(a+b\log\left(cx^n\right)\right)}{6e^2(d+ex)^6} - \frac{a+b\log\left(cx^n\right)}{5e^2(d+ex)^5} - (bn)\int \frac{-d-6ex}{30e^2x(d+ex)^6}\,dx$$
$$= \frac{d\left(a+b\log\left(cx^n\right)\right)}{6e^2(d+ex)^6} - \frac{a+b\log\left(cx^n\right)}{5e^2(d+ex)^5} - \frac{(bn)\int \frac{-d-6ex}{x(d+ex)^6}\,dx}{30e^2}$$
$$= \frac{d\left(a+b\log\left(cx^n\right)\right)}{6e^2(d+ex)^6} - \frac{a+b\log\left(cx^n\right)}{5e^2(d+ex)^5} - \frac{(bn)\int \left(-\frac{1}{d^5x} - \frac{5e}{(d+ex)^6} + \frac{e}{d(d+ex)^5} + \frac{e}{d^2(d+ex)^4} + \dots}{30e^2}$$
$$= -\frac{bn}{30e^2(d+ex)^5} + \frac{bn}{120de^2(d+ex)^4} + \frac{bn}{90d^2e^2(d+ex)^3} + \frac{bn}{60d^3e^2(d+ex)^2} + \frac{bn}{30d^4e^2(d \dots}$$

Mathematica [A] time = 0.15, size = 160, normalized size = 0.92

$$\frac{60ad^6 - 72ad^5(d+ex) + 60bd^6\log\left(cx^n\right) - 72bd^5(d+ex)\log\left(cx^n\right) - 12bd^5n(d+ex) + 3bd^4n(d+ex)^2 + 4bd^3n(d \dots}{360d^5e^2(d+ex)^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (60*a*d^6 - 72*a*d^5*(d + e*x) - 12*b*d^5*n*(d + e*x) + 3*b*d^4*n*(d + e*x)
^2 + 4*b*d^3*n*(d + e*x)^3 + 6*b*d^2*n*(d + e*x)^4 + 12*b*d*n*(d + e*x)^5 +
 12*b*n*(d + e*x)^6*Log[x] + 60*b*d^6*Log[c*x^n] - 72*b*d^5*(d + e*x)*Log[c
*x^n] - 12*b*n*(d + e*x)^6*Log[d + e*x])/(360*d^5*e^2*(d + e*x)^6)
```

fricas [B] time = 0.81, size = 323, normalized size = 1.86

$$\frac{12\,bde^5nx^5 + 66\,bd^2e^4nx^4 + 148\,bd^3e^3nx^3 + 171\,bd^4e^2nx^2 + 13\,bd^6n - 12\,ad^6 + 18\left(5\,bd^5en - 4\,ad^5e\right)x - 12\left(be^6n \dots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/360*(12*b*d*e^5*n*x^5 + 66*b*d^2*e^4*n*x^4 + 148*b*d^3*e^3*n*x^3 + 171*b*
d^4*e^2*n*x^2 + 13*b*d^6*n - 12*a*d^6 + 18*(5*b*d^5*e*n - 4*a*d^5*e)*x - 12
*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e^3*n*x^3 +
 15*b*d^4*e^2*n*x^2 + 6*b*d^5*e*n*x + b*d^6*n)*log(e*x + d) - 12*(6*b*d^5*e
*x + b*d^6)*log(c) + 12*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4
 + 20*b*d^3*e^3*n*x^3 + 15*b*d^4*e^2*n*x^2)*log(x))/(d^5*e^8*x^6 + 6*d^6*e^
7*x^5 + 15*d^7*e^6*x^4 + 20*d^8*e^5*x^3 + 15*d^9*e^4*x^2 + 6*d^10*e^3*x + d
^11*e^2)
```

giac [B] time = 0.34, size = 352, normalized size = 2.02

$$-\frac{12\,bnx^6e^6\log\left(xe+d\right) + 72\,bdnx^5e^5\log\left(xe+d\right) + 180\,bd^2nx^4e^4\log\left(xe+d\right) + 240\,bd^3nx^3e^3\log\left(xe+d\right) + 180\,b \dots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/360*(12*b*n*x^6*e^6*log(x*e + d) + 72*b*d*n*x^5*e^5*log(x*e + d) + 180*b
*d^2*n*x^4*e^4*log(x*e + d) + 240*b*d^3*n*x^3*e^3*log(x*e + d) + 180*b*d^4*
n*x^2*e^2*log(x*e + d) + 72*b*d^5*n*x*e*log(x*e + d) - 12*b*n*x^6*e^6*log(x
```

```
) - 72*b*d*n*x^5*e^5*log(x) - 180*b*d^2*n*x^4*e^4*log(x) - 240*b*d^3*n*x^3*
e^3*log(x) - 180*b*d^4*n*x^2*e^2*log(x) - 12*b*d*n*x^5*e^5 - 66*b*d^2*n*x^4
*e^4 - 148*b*d^3*n*x^3*e^3 - 171*b*d^4*n*x^2*e^2 - 90*b*d^5*n*x*e + 12*b*d^
6*n*log(x*e + d) + 72*b*d^5*x*e*log(c) - 13*b*d^6*n + 72*a*d^5*x*e + 12*b*d
^6*log(c) + 12*a*d^6)/(d^5*x^6*e^8 + 6*d^6*x^5*e^7 + 15*d^7*x^4*e^6 + 20*d^
8*x^3*e^5 + 15*d^9*x^2*e^4 + 6*d^10*x*e^3 + d^11*e^2)
```

maple [C] time = 0.25, size = 557, normalized size = 3.20

$$-\frac{(6ex+d)\,b\ln(x^n)}{30\,(ex+d)^6\,e^2}-\frac{-6i\pi b\,d^6\mathrm{csgn}\,(ic\,x^n)^3-12bd\,e^5n\,x^5-66b\,d^2e^4n\,x^4-148b\,d^3e^3n\,x^3-171b\,d^4e^2n\,x^2-90b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x+d)^7,x)
```

```
[Out] -1/30*b*(6*e*x+d)/(e*x+d)^6/e^2*ln(x^n)-1/360*(-12*b*d*e^5*n*x^5-66*b*d^2*e
^4*n*x^4-148*b*d^3*e^3*n*x^3-171*b*d^4*e^2*n*x^2-90*b*d^5*e*n*x+12*b*d^6*n*
ln(e*x+d)-12*b*d^6*n*ln(-x)+72*a*d^5*e*x+12*a*d^6+12*b*d^6*ln(c)-13*b*d^6*n
+36*I*Pi*b*d^5*e*x*csgn(I*c)*csgn(I*c*x^n)^2+12*b*e^6*n*x^6*ln(e*x+d)-12*b*
e^6*n*x^6*ln(-x)+36*I*Pi*b*d^5*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+72*b*d^5*e*x
*ln(c)-6*I*Pi*b*d^6*csgn(I*c*x^n)^3-36*I*Pi*b*d^5*e*x*csgn(I*c)*csgn(I*x^n)
*csgn(I*c*x^n)+6*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)^2+6*I*Pi*b*d^6*csgn(I
*c)*csgn(I*c*x^n)^2+72*b*d*e^5*n*x^5*ln(e*x+d)+180*b*d^2*e^4*n*x^4*ln(e*x+d
)+240*b*d^3*e^3*n*x^3*ln(e*x+d)+180*b*d^4*e^2*n*x^2*ln(e*x+d)+72*b*d^5*e*n*
x*ln(e*x+d)-72*b*d*e^5*n*x^5*ln(-x)-180*b*d^2*e^4*n*x^4*ln(-x)-240*b*d^3*e^
3*n*x^3*ln(-x)-180*b*d^4*e^2*n*x^2*ln(-x)-72*b*d^5*e*n*x*ln(-x)-36*I*Pi*b*d
^5*e*x*csgn(I*c*x^n)^3-6*I*Pi*b*d^6*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n))/e^
2/d^5/(e*x+d)^6
```

maxima [A] time = 0.60, size = 294, normalized size = 1.69

$$\frac{1}{360}\,bn\left(\frac{12\,e^4x^4+54\,de^3x^3+94\,d^2e^2x^2+77\,d^3ex+13\,d^4}{d^4e^7x^5+5\,d^5e^6x^4+10\,d^6e^5x^3+10\,d^7e^4x^2+5\,d^8e^3x+d^9e^2}-\frac{12\,\log(ex+d)}{d^5e^2}+\frac{12\,\log(x)}{d^5e^2}\right)-\frac{}{30\,(e^8x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/360*b*n*((12*e^4*x^4 + 54*d*e^3*x^3 + 94*d^2*e^2*x^2 + 77*d^3*e*x + 13*d^
4)/(d^4*e^7*x^5 + 5*d^5*e^6*x^4 + 10*d^6*e^5*x^3 + 10*d^7*e^4*x^2 + 5*d^8*e
^3*x + d^9*e^2) - 12*log(e*x + d)/(d^5*e^2) + 12*log(x)/(d^5*e^2)) - 1/30*(
6*e*x + d)*b*log(c*x^n)/(e^8*x^6 + 6*d*e^7*x^5 + 15*d^2*e^6*x^4 + 20*d^3*e^
5*x^3 + 15*d^4*e^4*x^2 + 6*d^5*e^3*x + d^6*e^2) - 1/30*(6*e*x + d)*a/(e^8*x
^6 + 6*d*e^7*x^5 + 15*d^2*e^6*x^4 + 20*d^3*e^5*x^3 + 15*d^4*e^4*x^2 + 6*d^5
*e^3*x + d^6*e^2)
```

mupad [B] time = 4.04, size = 251, normalized size = 1.44

$$\frac{\frac{13\,b\,d\,n}{12}-x\,\left(6\,a\,e-\frac{15\,b\,e\,n}{2}\right)-a\,d+\frac{57\,b\,e^2\,n\,x^2}{4\,d}+\frac{37\,b\,e^3\,n\,x^3}{3\,d^2}+\frac{11\,b\,e^4\,n\,x^4}{2\,d^3}+\frac{b\,e^5\,n\,x^5}{d^4}}{30\,d^6\,e^2+180\,d^5\,e^3\,x+450\,d^4\,e^4\,x^2+600\,d^3\,e^5\,x^3+450\,d^2\,e^6\,x^4+180\,d\,e^7\,x^5+30\,e^8\,x^6}-\frac{}{d^6+6\,d^5\,e\,x+15\,d^4\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x)^7,x)
```

```
[Out] ((13*b*d*n)/12 - x*(6*a*e - (15*b*e*n)/2) - a*d + (57*b*e^2*n*x^2)/(4*d) +
(37*b*e^3*n*x^3)/(3*d^2) + (11*b*e^4*n*x^4)/(2*d^3) + (b*e^5*n*x^5)/d^4)/(3
0*d^6*e^2 + 30*e^8*x^6 + 180*d^5*e^3*x + 180*d*e^7*x^5 + 450*d^4*e^4*x^2 +
600*d^3*e^5*x^3 + 450*d^2*e^6*x^4) - (log(c*x^n)*((b*d)/(30*e^2) + (b*x)/(5
```

```
*e)))/(d^6 + e^6*x^6 + 6*d*e^5*x^5 + 15*d^4*e^2*x^2 + 20*d^3*e^3*x^3 + 15*d
^2*e^4*x^4 + 6*d^5*e*x) - (b*n*atanh((2*e*x)/d + 1))/(15*d^5*e^2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Timed out
```

3.70 $\int \frac{a+b\log(cx^n)}{(d+ex)^7}\,dx$

Optimal. Leaf size=152

$$-\frac{a+b\log(cx^n)}{6e(d+ex)^6}+\frac{bn\log(x)}{6d^6e}-\frac{bn\log(d+ex)}{6d^6e}+\frac{bn}{6d^5e(d+ex)}+\frac{bn}{12d^4e(d+ex)^2}+\frac{bn}{18d^3e(d+ex)^3}+\frac{bn}{24d^2e(d+ex)^4}+$$

```
[Out] 1/30*b*n/d/e/(e*x+d)^5+1/24*b*n/d^2/e/(e*x+d)^4+1/18*b*n/d^3/e/(e*x+d)^3+1/
12*b*n/d^4/e/(e*x+d)^2+1/6*b*n/d^5/e/(e*x+d)+1/6*b*n*ln(x)/d^6/e+1/6*(-a-b*
ln(c*x^n))/e/(e*x+d)^6-1/6*b*n*ln(e*x+d)/d^6/e
```

Rubi [A] time = 0.07, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2319, 44}

$$-\frac{a+b\log(cx^n)}{6e(d+ex)^6}+\frac{bn}{6d^5e(d+ex)}+\frac{bn}{12d^4e(d+ex)^2}+\frac{bn}{18d^3e(d+ex)^3}+\frac{bn}{24d^2e(d+ex)^4}+\frac{bn\log(x)}{6d^6e}-\frac{bn\log(d+ex)}{6d^6e}+$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x)^7,x]
```

```
[Out] (b*n)/(30*d*e*(d + e*x)^5) + (b*n)/(24*d^2*e*(d + e*x)^4) + (b*n)/(18*d^3*e
*(d + e*x)^3) + (b*n)/(12*d^4*e*(d + e*x)^2) + (b*n)/(6*d^5*e*(d + e*x)) +
(b*n*Log[x])/(6*d^6*e) - (a + b*Log[c*x^n])/(6*e*(d + e*x)^6) - (b*n*Log[d
+ e*x])/(6*d^6*e)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2319

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

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx^n)}{(d+ex)^7}\,dx &= -\frac{a+b\log(cx^n)}{6e(d+ex)^6}+\frac{(bn)\int \frac{1}{x(d+ex)^6}\,dx}{6e}\\
&= -\frac{a+b\log(cx^n)}{6e(d+ex)^6}+\frac{(bn)\int \left(\frac{1}{d^6x}-\frac{e}{d(d+ex)^6}-\frac{e}{d^2(d+ex)^5}-\frac{e}{d^3(d+ex)^4}-\frac{e}{d^4(d+ex)^3}-\frac{e}{d^5(d+ex)^2}-\right.}{6e}\\
&= \frac{bn}{30de(d+ex)^5}+\frac{bn}{24d^2e(d+ex)^4}+\frac{bn}{18d^3e(d+ex)^3}+\frac{bn}{12d^4e(d+ex)^2}+\frac{bn}{6d^5e(d+ex)}+
\end{aligned}$$

Mathematica [A] time = 0.15, size = 99, normalized size = 0.65

$$\frac{\frac{bn\left(\frac{d(137d^4+385d^3ex+470d^2e^2x^2+270de^3x^3+60e^4x^4)}{(d+ex)^5}-60\log(d+ex)+60\log(x)\right)}{60d^6}-\frac{a+b\log(cx^n)}{(d+ex)^6}}{6e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x)^7,x]
```

```
[Out] (-((a + b*Log[c*x^n])/(d + e*x)^6) + (b*n*((d*(137*d^4 + 385*d^3*e*x + 470*
d^2*e^2*x^2 + 270*d*e^3*x^3 + 60*e^4*x^4))/(d + e*x)^5 + 60*Log[x] - 60*Log
[d + e*x]))/(60*d^6))/(6*e)
```

fricas [B] time = 0.85, size = 310, normalized size = 2.04

$$\frac{60\,bde^5nx^5 + 330\,bd^2e^4nx^4 + 740\,bd^3e^3nx^3 + 855\,bd^4e^2nx^2 + 522\,bd^5enx + 137\,bd^6n - 60\,bd^6\log(c) - 60\,ad^6 - 6}{36}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/360*(60*b*d*e^5*n*x^5 + 330*b*d^2*e^4*n*x^4 + 740*b*d^3*e^3*n*x^3 + 855*b
*d^4*e^2*n*x^2 + 522*b*d^5*e*n*x + 137*b*d^6*n - 60*b*d^6*log(c) - 60*a*d^6
 - 60*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e^3*n*
x^3 + 15*b*d^4*e^2*n*x^2 + 6*b*d^5*e*n*x + b*d^6*n)*log(e*x + d) + 60*(b*e^
6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e^3*n*x^3 + 15*b*
d^4*e^2*n*x^2 + 6*b*d^5*e*n*x)*log(x))/(d^6*e^7*x^6 + 6*d^7*e^6*x^5 + 15*d^
8*e^5*x^4 + 20*d^9*e^4*x^3 + 15*d^10*e^3*x^2 + 6*d^11*e^2*x + d^12*e)
```

giac [B] time = 0.31, size = 344, normalized size = 2.26

$$-\frac{60\,bnx^6e^6\log\left(xe+d\right) + 360\,bdnx^5e^5\log\left(xe+d\right) + 900\,bd^2nx^4e^4\log\left(xe+d\right) + 1200\,bd^3nx^3e^3\log\left(xe+d\right) + 9}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/360*(60*b*n*x^6*e^6*log(x*e + d) + 360*b*d*n*x^5*e^5*log(x*e + d) + 900*
b*d^2*n*x^4*e^4*log(x*e + d) + 1200*b*d^3*n*x^3*e^3*log(x*e + d) + 900*b*d^
4*n*x^2*e^2*log(x*e + d) + 360*b*d^5*n*x*e*log(x*e + d) - 60*b*n*x^6*e^6*lo
g(x) - 360*b*d*n*x^5*e^5*log(x) - 900*b*d^2*n*x^4*e^4*log(x) - 1200*b*d^3*n
*x^3*e^3*log(x) - 900*b*d^4*n*x^2*e^2*log(x) - 360*b*d^5*n*x*e*log(x) - 60*
b*d*n*x^5*e^5 - 330*b*d^2*n*x^4*e^4 - 740*b*d^3*n*x^3*e^3 - 855*b*d^4*n*x^2
*e^2 - 522*b*d^5*n*x*e + 60*b*d^6*n*log(x*e + d) - 137*b*d^6*n + 60*b*d^6*l
og(c) + 60*a*d^6)/(d^6*x^6*e^7 + 6*d^7*x^5*e^6 + 15*d^8*x^4*e^5 + 20*d^9*x^
3*e^4 + 15*d^10*x^2*e^3 + 6*d^11*x*e^2 + d^12*e)
```

maple [C] time = 0.21, size = 431, normalized size = 2.84

$$-\frac{b\ln\left(x^n\right)}{6\left(ex+d\right)^6e}-\frac{-30i\pi b\,d^6\mathrm{csgn}\left(ic\,x^n\right)^3 - 60bd\,e^5n\,x^5 - 330b\,d^2e^4n\,x^4 - 740b\,d^3e^3n\,x^3 - 855b\,d^4e^2n\,x^2 - 522b\,d^5e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x+d)^7,x)
```

```
[Out] -1/6*b/e/(e*x+d)^6*ln(x^n)-1/360*(-60*b*d*e^5*n*x^5-330*b*d^2*e^4*n*x^4-740
*b*d^3*e^3*n*x^3-855*b*d^4*e^2*n*x^2-522*b*d^5*e*n*x+60*b*d^6*n*ln(e*x+d)-6
0*b*d^6*n*ln(-x)+60*a*d^6+60*b*d^6*ln(c)-137*b*d^6*n-30*I*Pi*b*d^6*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-30*I*Pi*b*d^6*csgn(I*c*x^n)^3+60*b*e^6*n*x^6*ln
(e*x+d)-60*b*e^6*n*x^6*ln(-x)+30*I*Pi*b*d^6*csgn(I*c*x^n)^2*csgn(I*c)+30*I*
Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)^2+360*b*d*e^5*n*x^5*ln(e*x+d)+900*b*d^2*
e^4*n*x^4*ln(e*x+d)+1200*b*d^3*e^3*n*x^3*ln(e*x+d)+900*b*d^4*e^2*n*x^2*ln(e
*x+d)+360*b*d^5*e*n*x*ln(e*x+d)-360*b*d*e^5*n*x^5*ln(-x)-900*b*d^2*e^4*n*x^
```

```
4*ln(-x)-1200*b*d^3*e^3*n*x^3*ln(-x)-900*b*d^4*e^2*n*x^2*ln(-x)-360*b*d^5*e
*n*x*ln(-x))/d^6/e/(e*x+d)^6
```

maxima [B] time = 0.89, size = 276, normalized size = 1.82

$$\frac{1}{360}\,bn\left(\frac{60\,e^4x^4+270\,de^3x^3+470\,d^2e^2x^2+385\,d^3ex+137\,d^4}{d^5e^6x^5+5\,d^6e^5x^4+10\,d^7e^4x^3+10\,d^8e^3x^2+5\,d^9e^2x+d^{10}e}-\frac{60\,\log\left(ex+d\right)}{d^6e}+\frac{60\,\log(x)}{d^6e}\right)-\frac{}{6\left(e^7x^6+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/360*b*n*((60*e^4*x^4 + 270*d*e^3*x^3 + 470*d^2*e^2*x^2 + 385*d^3*e*x + 13
7*d^4)/(d^5*e^6*x^5 + 5*d^6*e^5*x^4 + 10*d^7*e^4*x^3 + 10*d^8*e^3*x^2 + 5*d
^9*e^2*x + d^10*e) - 60*log(e*x + d)/(d^6*e) + 60*log(x)/(d^6*e)) - 1/6*b*l
og(c*x^n)/(e^7*x^6 + 6*d*e^6*x^5 + 15*d^2*e^5*x^4 + 20*d^3*e^4*x^3 + 15*d^4
*e^3*x^2 + 6*d^5*e^2*x + d^6*e) - 1/6*a/(e^7*x^6 + 6*d*e^6*x^5 + 15*d^2*e^5
*x^4 + 20*d^3*e^4*x^3 + 15*d^4*e^3*x^2 + 6*d^5*e^2*x + d^6*e)
```

mupad [B] time = 3.93, size = 232, normalized size = 1.53

$$\frac{\frac{137\,b\,n}{60}-a+\frac{57\,b\,e^2\,n\,x^2}{4\,d^2}+\frac{37\,b\,e^3\,n\,x^3}{3\,d^3}+\frac{11\,b\,e^4\,n\,x^4}{2\,d^4}+\frac{b\,e^5\,n\,x^5}{d^5}+\frac{87\,b\,e\,n\,x}{10\,d}}{6\,d^6\,e+36\,d^5\,e^2\,x+90\,d^4\,e^3\,x^2+120\,d^3\,e^4\,x^3+90\,d^2\,e^5\,x^4+36\,d\,e^6\,x^5+6\,e^7\,x^6}-\frac{}{6\,e\,\left(d^6+6\,d^5\,e\,x+15\,d^4\,e^2\,x^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x)^7,x)
```

```
[Out] ((137*b*n)/60 - a + (57*b*e^2*n*x^2)/(4*d^2) + (37*b*e^3*n*x^3)/(3*d^3) + (
11*b*e^4*n*x^4)/(2*d^4) + (b*e^5*n*x^5)/d^5 + (87*b*e*n*x)/(10*d))/(6*d^6*e
 + 6*e^7*x^6 + 36*d^5*e^2*x + 36*d*e^6*x^5 + 90*d^4*e^3*x^2 + 120*d^3*e^4*x
^3 + 90*d^2*e^5*x^4) - (b*log(c*x^n))/(6*e*(d^6 + e^6*x^6 + 6*d*e^5*x^5 + 1
5*d^4*e^2*x^2 + 20*d^3*e^3*x^3 + 15*d^2*e^4*x^4 + 6*d^5*e*x)) - (b*n*atanh(
(2*e*x)/d + 1))/(3*d^6*e)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Timed out
```

3.71 $\int \frac{a+b\log(cx^n)}{x(d+ex)^7}\,dx$

Optimal. Leaf size=294

$$-\frac{\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^7}-\frac{ex\left(a+b\log\left(cx^n\right)\right)}{d^7(d+ex)}+\frac{a+b\log\left(cx^n\right)}{2d^5(d+ex)^2}+\frac{a+b\log\left(cx^n\right)}{3d^4(d+ex)^3}+\frac{a+b\log\left(cx^n\right)}{4d^3(d+ex)^4}+\frac{a+b\log}{5d^2(d+}$$

```
[Out] -1/30*b*n/d^2/(e*x+d)^5-11/120*b*n/d^3/(e*x+d)^4-37/180*b*n/d^4/(e*x+d)^3-1
9/40*b*n/d^5/(e*x+d)^2-29/20*b*n/d^6/(e*x+d)-29/20*b*n*ln(x)/d^7+1/6*(a+b*l
n(c*x^n))/d/(e*x+d)^6+1/5*(a+b*ln(c*x^n))/d^2/(e*x+d)^5+1/4*(a+b*ln(c*x^n))
/d^3/(e*x+d)^4+1/3*(a+b*ln(c*x^n))/d^4/(e*x+d)^3+1/2*(a+b*ln(c*x^n))/d^5/(e
*x+d)^2-e*x*(a+b*ln(c*x^n))/d^7/(e*x+d)-ln(1+d/e/x)*(a+b*ln(c*x^n))/d^7+49/
20*b*n*ln(e*x+d)/d^7+b*n*polylog(2,-d/e/x)/d^7
```

Rubi [A] time = 0.73, antiderivative size = 316, normalized size of antiderivative = 1.07, number of steps used = 27, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {2347, 2344, 2301, 2317, 2391, 2314, 31, 2319, 44}

$$-\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^7}-\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^7}-\frac{ex\left(a+b\log\left(cx^n\right)\right)}{d^7(d+ex)}+\frac{a+b\log\left(cx^n\right)}{2d^5(d+ex)^2}+\frac{a+b\log\left(cx^n\right)}{3d^4(d+ex)^3}+\frac{a+}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x)^7),x]
```

```
[Out] -(b*n)/(30*d^2*(d + e*x)^5) - (11*b*n)/(120*d^3*(d + e*x)^4) - (37*b*n)/(18
0*d^4*(d + e*x)^3) - (19*b*n)/(40*d^5*(d + e*x)^2) - (29*b*n)/(20*d^6*(d +
e*x)) - (29*b*n*Log[x])/(20*d^7) + (a + b*Log[c*x^n])/(6*d*(d + e*x)^6) + (
a + b*Log[c*x^n])/(5*d^2*(d + e*x)^5) + (a + b*Log[c*x^n])/(4*d^3*(d + e*x)
^4) + (a + b*Log[c*x^n])/(3*d^4*(d + e*x)^3) + (a + b*Log[c*x^n])/(2*d^5*(d
 + e*x)^2) - (e*x*(a + b*Log[c*x^n]))/(d^7*(d + e*x)) + (a + b*Log[c*x^n])^
2/(2*b*d^7*n) + (49*b*n*Log[d + e*x])/(20*d^7) - ((a + b*Log[c*x^n])*Log[1
+ (e*x)/d])/d^7 - (b*n*PolyLog[2, -((e*x)/d)])/d^7
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2344

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

Rule 2347

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

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex)^7}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^6}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^7}\,dx}{d}$$

$$= \frac{a+b\log(cx^n)}{6d(d+ex)^6} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^5}\,dx}{d^2} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^6}\,dx}{d^2} - \frac{(bn)\int \frac{1}{x(d+ex)^6}\,dx}{6d}$$

$$= \frac{a+b\log(cx^n)}{6d(d+ex)^6} + \frac{a+b\log(cx^n)}{5d^2(d+ex)^5} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^4}\,dx}{d^3} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^5}\,dx}{d^3} - \frac{(bn)\int \frac{1}{x(d+ex)^5}\,d}{5d^2}$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{bn}{24d^3(d+ex)^4} - \frac{bn}{18d^4(d+ex)^3} - \frac{bn}{12d^5(d+ex)^2} - \frac{bn}{6d^6(d+ex)} - \frac{bn\log}{6d}$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{11bn}{120d^3(d+ex)^4} - \frac{11bn}{90d^4(d+ex)^3} - \frac{11bn}{60d^5(d+ex)^2} - \frac{11bn}{30d^6(d+ex)} - 11b$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{11bn}{120d^3(d+ex)^4} - \frac{37bn}{180d^4(d+ex)^3} - \frac{37bn}{120d^5(d+ex)^2} - \frac{37bn}{60d^6(d+ex)} - 3$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{11bn}{120d^3(d+ex)^4} - \frac{37bn}{180d^4(d+ex)^3} - \frac{19bn}{40d^5(d+ex)^2} - \frac{19bn}{20d^6(d+ex)} - 19$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{11bn}{120d^3(d+ex)^4} - \frac{37bn}{180d^4(d+ex)^3} - \frac{19bn}{40d^5(d+ex)^2} - \frac{29bn}{20d^6(d+ex)} - 29$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{11bn}{120d^3(d+ex)^4} - \frac{37bn}{180d^4(d+ex)^3} - \frac{19bn}{40d^5(d+ex)^2} - \frac{29bn}{20d^6(d+ex)} - 29$$

Mathematica [A] time = 0.37, size = 349, normalized size = 1.19

$$\frac{\frac{360a\log(cx^n)}{n} + \frac{60ad^6}{(d+ex)^6} + \frac{72ad^5}{(d+ex)^5} + \frac{90ad^4}{(d+ex)^4} + \frac{120ad^3}{(d+ex)^3} + \frac{180ad^2}{(d+ex)^2} + \frac{360ad}{d+ex} - 360a\log\left(\frac{ex}{d}+1\right) + \frac{60bd^6\log(cx^n)}{(d+ex)^6} + \frac{72bd^5\log(cx^n)}{(d+ex)^5}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x)^7),x]
```

```
[Out] ((60*a*d^6)/(d + e*x)^6 + (72*a*d^5)/(d + e*x)^5 - (12*b*d^5*n)/(d + e*x)^5
 + (90*a*d^4)/(d + e*x)^4 - (33*b*d^4*n)/(d + e*x)^4 + (120*a*d^3)/(d + e*x
)^3 - (74*b*d^3*n)/(d + e*x)^3 + (180*a*d^2)/(d + e*x)^2 - (171*b*d^2*n)/(d
 + e*x)^2 + (360*a*d)/(d + e*x) - (522*b*d*n)/(d + e*x) - 882*b*n*Log[x] +
(360*a*Log[c*x^n])/n + (60*b*d^6*Log[c*x^n])/(d + e*x)^6 + (72*b*d^5*Log[c*
x^n])/(d + e*x)^5 + (90*b*d^4*Log[c*x^n])/(d + e*x)^4 + (120*b*d^3*Log[c*x^
n])/(d + e*x)^3 + (180*b*d^2*Log[c*x^n])/(d + e*x)^2 + (360*b*d*Log[c*x^n])
/(d + e*x) + (180*b*Log[c*x^n]^2)/n + 882*b*n*Log[d + e*x] - 360*a*Log[1 +
(e*x)/d] - 360*b*Log[c*x^n]*Log[1 + (e*x)/d] - 360*b*n*PolyLog[2, -((e*x)/d
)])/(360*d^7)
```

fricas [F] time = 0.82, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{e^7x^8+7\,de^6x^7+21\,d^2e^5x^6+35\,d^3e^4x^5+35\,d^4e^3x^4+21\,d^5e^2x^3+7\,d^6ex^2+d^7x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e^7*x^8 + 7*d*e^6*x^7 + 21*d^2*e^5*x^6 + 35*d^
3*e^4*x^5 + 35*d^4*e^3*x^4 + 21*d^5*e^2*x^3 + 7*d^6*e*x^2 + d^7*x), x)
```

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

$$\int \frac{b \log (cx^n) + a}{(ex + d)^7 x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^7*x), x)
```

maple [C] time = 0.22, size = 1427, normalized size = 4.85

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x+d)^7,x)
```

```
[Out] 1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^5/(e*x+d)^2+1/12*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)^2/d/(e*x+d)^6+b*n/d^7*ln(e*x+d)*ln(-1/d*e*x)-1/12*I*b*Pi*cs
gn(I*c*x^n)^3/d/(e*x+d)^6-1/10*I*b*Pi*csgn(I*c*x^n)^3/d^2/(e*x+d)^5-1/2*I*b
*Pi*csgn(I*c*x^n)^3/d^7*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^6/(e*x+d)-1/4*I*
b*Pi*csgn(I*c*x^n)^3/d^5/(e*x+d)^2-1/8*I*b*Pi*csgn(I*c*x^n)^3/d^3/(e*x+d)^4
-1/6*I*b*Pi*csgn(I*c*x^n)^3/d^4/(e*x+d)^3+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^7*ln
(e*x+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^5/(e*x+d)^2-1/2*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^6/(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)/d^7*ln(x)-1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)/d^3/(e*x+d)^4+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^7*ln(
e*x+d)-1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/(e*x+d)^6+b*ln(x^n
)/d^7*ln(x)-b*ln(x^n)/d^7*ln(e*x+d)+b*ln(x^n)/d^6/(e*x+d)+1/2*b*ln(x^n)/d^5
/(e*x+d)^2+1/3*b*ln(x^n)/d^4/(e*x+d)^3+1/4*b*ln(x^n)/d^3/(e*x+d)^4+1/5*b*ln
(x^n)/d^2/(e*x+d)^5+1/6*b*ln(x^n)/d/(e*x+d)^6+a/d^6/(e*x+d)+1/2*a/d^5/(e*x+
d)^2+1/3*a/d^4/(e*x+d)^3+1/4*a/d^3/(e*x+d)^4+1/5*a/d^2/(e*x+d)^5+1/6*a/d/(e
*x+d)^6+a/d^7*ln(x)-a/d^7*ln(e*x+d)-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)/d^4/(e*x+d)^3+1/6*b*ln(c)/d/(e*x+d)^6+b*ln(c)/d^7*ln(x)-b*ln(c)/d^7
*ln(e*x+d)+b*ln(c)/d^6/(e*x+d)+1/2*b*ln(c)/d^5/(e*x+d)^2+1/3*b*ln(c)/d^4/(e
*x+d)^3+1/4*b*ln(c)/d^3/(e*x+d)^4+1/5*b*ln(c)/d^2/(e*x+d)^5-1/2*b*n/d^7*ln(
x)^2+b*n/d^7*dilog(-1/d*e*x)-1/10*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)/d^2/(e*x+d)^5+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^6/(e*x+d)+1/6*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4/(e*x+d)^3+1/8*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)^2/d^3/(e*x+d)^4-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^7*ln(e*x+d)
+1/12*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(e*x+d)^6+1/10*I*b*Pi*csgn(I*x^n)*
csgn(I*c*x^n)^2/d^2/(e*x+d)^5+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^7*ln(x
)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^7*ln(e*x+d)+1/4*I*b*Pi*csgn(I*c*x^
n)^2*csgn(I*c)/d^5/(e*x+d)^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^6/(e*x+
d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^7*ln(x)+1/10*I*b*Pi*csgn(I*c*x^
n)^2*csgn(I*c)/d^2/(e*x+d)^5+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4/(e*x+
d)^3+1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3/(e*x+d)^4-1/30*b*n/d^2/(e*x+d
)^5-11/120*b*n/d^3/(e*x+d)^4-37/180*b*n/d^4/(e*x+d)^3-19/40*b*n/d^5/(e*x+d)
^2-29/20*b*n/d^6/(e*x+d)-49/20*b*n*ln(x)/d^7+49/20*b*n*ln(e*x+d)/d^7
```

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

$$\frac{1}{60}\, a\left(\frac{60\, e^5x^5 + 330\, de^4x^4 + 740\, d^2e^3x^3 + 855\, d^3e^2x^2 + 522\, d^4ex + 147\, d^5}{d^6e^6x^6 + 6\, d^7e^5x^5 + 15\, d^8e^4x^4 + 20\, d^9e^3x^3 + 15\, d^{10}e^2x^2 + 6\, d^{11}ex + d^{12}} - \frac{60\, \log (ex + d)}{d^7} + \frac{60\, \log(x)}{d^7}\right) +$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/60*a*((60*e^5*x^5 + 330*d*e^4*x^4 + 740*d^2*e^3*x^3 + 855*d^3*e^2*x^2 + 5
22*d^4*e*x + 147*d^5)/(d^6*e^6*x^6 + 6*d^7*e^5*x^5 + 15*d^8*e^4*x^4 + 20*d^
9*e^3*x^3 + 15*d^10*e^2*x^2 + 6*d^11*e*x + d^12) - 60*log(e*x + d)/d^7 + 60
*log(x)/d^7) + b*integrate((log(c) + log(x^n))/(e^7*x^8 + 7*d*e^6*x^7 + 21*
d^2*e^5*x^6 + 35*d^3*e^4*x^5 + 35*d^4*e^3*x^4 + 21*d^5*e^2*x^3 + 7*d^6*e*x^
2 + d^7*x), x)
```

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

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x\,{\left(d+e\,x\right)}^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x)^7),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x)^7), x)
```

sympy [F(-1)]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x+d)**7,x)
```

```
[Out] Timed out
```

3.72 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)^7}\,dx$

Optimal. Leaf size=339

$$\frac{6e^2x\left(a+b\log\left(cx^n\right)\right)}{d^8(d+ex)}+\frac{7e\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^8}-\frac{a+b\log\left(cx^n\right)}{d^7x}-\frac{5e\left(a+b\log\left(cx^n\right)\right)}{2d^6(d+ex)^2}-\frac{4e\left(a+b\log\left(c\right.\right.}{3d^5(d+ex)}$$

```
[Out] -b*n/d^7/x+1/30*b*e*n/d^3/(e*x+d)^5+17/120*b*e*n/d^4/(e*x+d)^4+79/180*b*e*n
/d^5/(e*x+d)^3+53/40*b*e*n/d^6/(e*x+d)^2+103/20*b*e*n/d^7/(e*x+d)+103/20*b*
e*n*ln(x)/d^8+(-a-b*ln(c*x^n))/d^7/x-1/6*e*(a+b*ln(c*x^n))/d^2/(e*x+d)^6-2/
5*e*(a+b*ln(c*x^n))/d^3/(e*x+d)^5-3/4*e*(a+b*ln(c*x^n))/d^4/(e*x+d)^4-4/3*e
*(a+b*ln(c*x^n))/d^5/(e*x+d)^3-5/2*e*(a+b*ln(c*x^n))/d^6/(e*x+d)^2+6*e^2*x*
(a+b*ln(c*x^n))/d^8/(e*x+d)+7*e*ln(1+d/e/x)*(a+b*ln(c*x^n))/d^8-223/20*b*e*
n*ln(e*x+d)/d^8-7*b*e*n*polylog(2,-d/e/x)/d^8
```

Rubi [A] time = 0.58, antiderivative size = 361, normalized size of antiderivative = 1.06, number of steps used = 23, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391}

$$\frac{7ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^8}+\frac{6e^2x\left(a+b\log\left(cx^n\right)\right)}{d^8(d+ex)}-\frac{7e\left(a+b\log\left(cx^n\right)\right)^2}{2bd^8n}-\frac{5e\left(a+b\log\left(cx^n\right)\right)}{2d^6(d+ex)^2}-\frac{4e\left(a+b\log\left(cx^n\right)\right)}{3d^5(d+ex)^3}$$

Antiderivative was successfully verified.

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

```
[Out] -((b*n)/(d^7*x)) + (b*e*n)/(30*d^3*(d + e*x)^5) + (17*b*e*n)/(120*d^4*(d +
e*x)^4) + (79*b*e*n)/(180*d^5*(d + e*x)^3) + (53*b*e*n)/(40*d^6*(d + e*x)^2
) + (103*b*e*n)/(20*d^7*(d + e*x)) + (103*b*e*n*Log[x])/(20*d^8) - (a + b*L
og[c*x^n])/(d^7*x) - (e*(a + b*Log[c*x^n]))/(6*d^2*(d + e*x)^6) - (2*e*(a +
 b*Log[c*x^n]))/(5*d^3*(d + e*x)^5) - (3*e*(a + b*Log[c*x^n]))/(4*d^4*(d +
e*x)^4) - (4*e*(a + b*Log[c*x^n]))/(3*d^5*(d + e*x)^3) - (5*e*(a + b*Log[c*
x^n]))/(2*d^6*(d + e*x)^2) + (6*e^2*x*(a + b*Log[c*x^n]))/(d^8*(d + e*x)) -
 (7*e*(a + b*Log[c*x^n])^2)/(2*b*d^8*n) - (223*b*e*n*Log[d + e*x])/(20*d^8)
 + (7*e*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^8 + (7*b*e*n*PolyLog[2, -((e
*x)/d)])/d^8
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
```

```
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

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

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

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

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex)^7}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^7x^2} - \frac{7e\left(a+b\log(cx^n)\right)}{d^8x} + \frac{e^2\left(a+b\log(cx^n)\right)}{d^2(d+ex)^7} + \frac{2e^2\left(a+b\log(cx^n)\right)}{d^3(d+ex)^6} + \right.$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^7} - \frac{(7e)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^8} + \frac{\left(7e^2\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^8} + \frac{\left(6e^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^7} +$$

$$= -\frac{bn}{d^7x} - \frac{a+b\log(cx^n)}{d^7x} - \frac{e\left(a+b\log(cx^n)\right)}{6d^2(d+ex)^6} - \frac{2e\left(a+b\log(cx^n)\right)}{5d^3(d+ex)^5} - \frac{3e\left(a+b\log(cx^n)\right)}{4d^4(d+ex)^4}$$

$$= -\frac{bn}{d^7x} - \frac{a+b\log(cx^n)}{d^7x} - \frac{e\left(a+b\log(cx^n)\right)}{6d^2(d+ex)^6} - \frac{2e\left(a+b\log(cx^n)\right)}{5d^3(d+ex)^5} - \frac{3e\left(a+b\log(cx^n)\right)}{4d^4(d+ex)^4}$$

$$= -\frac{bn}{d^7x} + \frac{ben}{30d^3(d+ex)^5} + \frac{17ben}{120d^4(d+ex)^4} + \frac{79ben}{180d^5(d+ex)^3} + \frac{53ben}{40d^6(d+ex)^2} + \frac{103ben}{20d^7(d+e}$$

Mathematica [A] time = 0.61, size = 401, normalized size = 1.18

$$-\frac{\frac{2520ae\log(cx^n)}{n}+\frac{60ad^6e}{(d+ex)^6}+\frac{144ad^5e}{(d+ex)^5}+\frac{270ad^4e}{(d+ex)^4}+\frac{480ad^3e}{(d+ex)^3}+\frac{900ad^2e}{(d+ex)^2}+\frac{2160ade}{d+ex}-2520ae\log\left(\frac{ex}{d}+1\right)+\frac{360ad}{x}+\frac{60bd^6e\log}{(d+ex}}{}$$

Antiderivative was successfully verified.

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

```
[Out] -1/360*((360*a*d)/x + (360*b*d*n)/x + (60*a*d^6*e)/(d + e*x)^6 + (144*a*d^5
*e)/(d + e*x)^5 - (12*b*d^5*e*n)/(d + e*x)^5 + (270*a*d^4*e)/(d + e*x)^4 -
(51*b*d^4*e*n)/(d + e*x)^4 + (480*a*d^3*e)/(d + e*x)^3 - (158*b*d^3*e*n)/(d
 + e*x)^3 + (900*a*d^2*e)/(d + e*x)^2 - (477*b*d^2*e*n)/(d + e*x)^2 + (2160
*a*d*e)/(d + e*x) - (1854*b*d*e*n)/(d + e*x) - 4014*b*e*n*Log[x] + (2520*a*
e*Log[c*x^n])/n + (360*b*d*Log[c*x^n])/x + (60*b*d^6*e*Log[c*x^n])/(d + e*x
)^6 + (144*b*d^5*e*Log[c*x^n])/(d + e*x)^5 + (270*b*d^4*e*Log[c*x^n])/(d +
e*x)^4 + (480*b*d^3*e*Log[c*x^n])/(d + e*x)^3 + (900*b*d^2*e*Log[c*x^n])/(d
 + e*x)^2 + (2160*b*d*e*Log[c*x^n])/(d + e*x) + (1260*b*e*Log[c*x^n]^2)/n +
 4014*b*e*n*Log[d + e*x] - 2520*a*e*Log[1 + (e*x)/d] - 2520*b*e*Log[c*x^n]*
Log[1 + (e*x)/d] - 2520*b*e*n*PolyLog[2, -((e*x)/d)])/d^8
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^7x^9+7\,de^6x^8+21\,d^2e^5x^7+35\,d^3e^4x^6+35\,d^4e^3x^5+21\,d^5e^2x^4+7\,d^6ex^3+d^7x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e^7*x^9 + 7*d*e^6*x^8 + 21*d^2*e^5*x^7 + 35*d^
3*e^4*x^6 + 35*d^4*e^3*x^5 + 21*d^5*e^2*x^4 + 7*d^6*e*x^3 + d^7*x^2), x)
```

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

$$\int\frac{b\log\left(cx^n\right)+a}{(ex+d)^7x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [C] time = 0.23, size = 1650, normalized size = 4.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^5/(e*x+d)^3+3/8*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e/(e*x+d)^4-1/5*I*b*Pi*csgn(I*c*x^n)
^2*csgn(I*c)/d^3*e/(e*x+d)^5-2/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^5/(
e*x+d)^3+7/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^8*e*ln(e*x+d)+1/2*I*b*Pi*cs
gn(I*c*x^n)^3/d^7/x+1/30*b*e*n/d^3/(e*x+d)^5+17/120*b*e*n/d^4/(e*x+d)^4+79/
180*b*e*n/d^5/(e*x+d)^3+53/40*b*e*n/d^6/(e*x+d)^2+103/20*b*e*n/d^7/(e*x+d)-
b*ln(x^n)/d^7/x-7*a/d^8*e*ln(x)+7*a/d^8*e*ln(e*x+d)-1/6*a*e/d^2/(e*x+d)^6-6
*a/d^7*e/(e*x+d)-5/2*a*e/d^6/(e*x+d)^2-4/3*a*e/d^5/(e*x+d)^3-3/4*a/d^4*e/(e
*x+d)^4-2/5*a/d^3*e/(e*x+d)^5-b*ln(c)/d^7/x-7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2/d^8*e*ln(x)-7/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^8*e*ln(x)-a/d^7/
```

```
x-3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^7*e/(e*x+d)-7*b*n/d^8*e*ln(e*x+d)*ln
(-1/d*e*x)-3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^7*e/(e*x+d)+3*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^7*e/(e*x+d)+5/4*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*e/d^6/(e*x+d)^2-3/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*
e/(e*x+d)^4-3/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e/(e*x+d)^4-7/2*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^8*e*ln(e*x+d)+1/5*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e/(e*x+d)^5+7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)/d^8*e*ln(x)-1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2/(e
*x+d)^6-5/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^6/(e*x+d)^2-2/3*I*b*Pi*csg
n(I*c*x^n)^2*csgn(I*c)*e/d^5/(e*x+d)^3-1/5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
^2/d^3*e/(e*x+d)^5+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^7/x-1/1
2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/(e*x+d)^6-5/4*I*b*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)^2*e/d^6/(e*x+d)^2+7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^8*e
*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^7/x+2/3*I*b*Pi*csgn(I*c*x
^n)^3*e/d^5/(e*x+d)^3+7/2*I*b*Pi*csgn(I*c*x^n)^3/d^8*e*ln(x)+1/12*I*b*Pi*cs
gn(I*c*x^n)^3*e/d^2/(e*x+d)^6+1/5*I*b*Pi*csgn(I*c*x^n)^3/d^3*e/(e*x+d)^5+3*
I*b*Pi*csgn(I*c*x^n)^3/d^7*e/(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2
/d^7/x+3/8*I*b*Pi*csgn(I*c*x^n)^3/d^4*e/(e*x+d)^4+5/4*I*b*Pi*csgn(I*c*x^n)^
3*e/d^6/(e*x+d)^2-7/2*I*b*Pi*csgn(I*c*x^n)^3/d^8*e*ln(e*x+d)+1/12*I*b*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/(e*x+d)^6-1/6*b*ln(x^n)*e/d^2/(e*x+
d)^6+7*b*ln(x^n)/d^8*e*ln(e*x+d)-6*b*ln(x^n)/d^7*e/(e*x+d)-5/2*b*ln(x^n)*e/
d^6/(e*x+d)^2-4/3*b*ln(x^n)*e/d^5/(e*x+d)^3-3/4*b*ln(x^n)/d^4*e/(e*x+d)^4-2
/5*b*ln(x^n)/d^3*e/(e*x+d)^5-7*b*ln(x^n)/d^8*e*ln(x)-2/5*b*ln(c)/d^3*e/(e*x
+d)^5-7*b*ln(c)/d^8*e*ln(x)+7*b*ln(c)/d^8*e*ln(e*x+d)-1/6*b*ln(c)*e/d^2/(e*
x+d)^6-6*b*ln(c)/d^7*e/(e*x+d)-5/2*b*ln(c)*e/d^6/(e*x+d)^2-4/3*b*ln(c)*e/d^
5/(e*x+d)^3-3/4*b*ln(c)/d^4*e/(e*x+d)^4+7/2*b*n/d^8*e*ln(x)^2-7*b*n/d^8*e*d
ilog(-1/d*e*x)-b*n/d^7/x+223/20*b*e*n*ln(x)/d^8-223/20*b*e*n*ln(e*x+d)/d^8
```

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

$$-\frac{1}{60}\,a\left(\frac{420\,e^{6}x^{6}+2310\,de^{5}x^{5}+5180\,d^{2}e^{4}x^{4}+5985\,d^{3}e^{3}x^{3}+3654\,d^{4}e^{2}x^{2}+1029\,d^{5}ex+60\,d^{6}}{d^{7}e^{6}x^{7}+6\,d^{8}e^{5}x^{6}+15\,d^{9}e^{4}x^{5}+20\,d^{10}e^{3}x^{4}+15\,d^{11}e^{2}x^{3}+6\,d^{12}ex^{2}+d^{13}x}-\frac{420\,e\log\left(ex+d\right)}{d^{8}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/60*a*((420*e^6*x^6 + 2310*d*e^5*x^5 + 5180*d^2*e^4*x^4 + 5985*d^3*e^3*x^
3 + 3654*d^4*e^2*x^2 + 1029*d^5*e*x + 60*d^6)/(d^7*e^6*x^7 + 6*d^8*e^5*x^6
+ 15*d^9*e^4*x^5 + 20*d^10*e^3*x^4 + 15*d^11*e^2*x^3 + 6*d^12*e*x^2 + d^13*
x) - 420*e*log(e*x + d)/d^8 + 420*e*log(x)/d^8) + b*integrate((log(c) + log
(x^n))/(e^7*x^9 + 7*d*e^6*x^8 + 21*d^2*e^5*x^7 + 35*d^3*e^4*x^6 + 35*d^4*e^
3*x^5 + 21*d^5*e^2*x^4 + 7*d^6*e*x^3 + d^7*x^2), x)
```

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

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^2\,{\left(d+e\,x\right)}^7} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x)^7), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.73 $\int \frac{a+b\log(cx^n)}{x^3(d+ex)^7}\,dx$

Optimal. Leaf size=401

$$-\frac{21e^3x\left(a+b\log\left(cx^n\right)\right)}{d^9(d+ex)}-\frac{28e^2\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^9}+\frac{7e\left(a+b\log\left(cx^n\right)\right)}{d^8x}+\frac{15e^2\left(a+b\log\left(cx^n\right)\right)}{2d^7(d+ex)^2}-\frac{a+\cdots}{\cdots}$$

```
[Out] -1/4*b*n/d^7/x^2+7*b*e*n/d^8/x-1/30*b*e^2*n/d^4/(e*x+d)^5-23/120*b*e^2*n/d^
5/(e*x+d)^4-34/45*b*e^2*n/d^6/(e*x+d)^3-14/5*b*e^2*n/d^7/(e*x+d)^2-131/10*b
*e^2*n/d^8/(e*x+d)-131/10*b*e^2*n*ln(x)/d^9+1/2*(-a-b*ln(c*x^n))/d^7/x^2+7*
e*(a+b*ln(c*x^n))/d^8/x+1/6*e^2*(a+b*ln(c*x^n))/d^3/(e*x+d)^6+3/5*e^2*(a+b*
ln(c*x^n))/d^4/(e*x+d)^5+3/2*e^2*(a+b*ln(c*x^n))/d^5/(e*x+d)^4+10/3*e^2*(a+
b*ln(c*x^n))/d^6/(e*x+d)^3+15/2*e^2*(a+b*ln(c*x^n))/d^7/(e*x+d)^2-21*e^3*x*
(a+b*ln(c*x^n))/d^9/(e*x+d)-28*e^2*ln(1+d/e/x)*(a+b*ln(c*x^n))/d^9+341/10*b
*e^2*n*ln(e*x+d)/d^9+28*b*e^2*n*polylog(2,-d/e/x)/d^9
```

Rubi [A] time = 0.64, antiderivative size = 423, normalized size of antiderivative = 1.05, number of steps used = 24, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391}

$$-\frac{28be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^9}-\frac{21e^3x\left(a+b\log\left(cx^n\right)\right)}{d^9(d+ex)}+\frac{14e^2\left(a+b\log\left(cx^n\right)\right)^2}{bd^9n}+\frac{15e^2\left(a+b\log\left(cx^n\right)\right)}{2d^7(d+ex)^2}+\frac{10e^2\left(a+\cdots\right)}{3d^6(\cdots)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x)^7),x]
```

```
[Out] -(b*n)/(4*d^7*x^2) + (7*b*e*n)/(d^8*x) - (b*e^2*n)/(30*d^4*(d + e*x)^5) - (
23*b*e^2*n)/(120*d^5*(d + e*x)^4) - (34*b*e^2*n)/(45*d^6*(d + e*x)^3) - (14
*b*e^2*n)/(5*d^7*(d + e*x)^2) - (131*b*e^2*n)/(10*d^8*(d + e*x)) - (131*b*e
^2*n*Log[x])/(10*d^9) - (a + b*Log[c*x^n])/(2*d^7*x^2) + (7*e*(a + b*Log[c*
x^n]))/(d^8*x) + (e^2*(a + b*Log[c*x^n]))/(6*d^3*(d + e*x)^6) + (3*e^2*(a +
 b*Log[c*x^n]))/(5*d^4*(d + e*x)^5) + (3*e^2*(a + b*Log[c*x^n]))/(2*d^5*(d
+ e*x)^4) + (10*e^2*(a + b*Log[c*x^n]))/(3*d^6*(d + e*x)^3) + (15*e^2*(a +
b*Log[c*x^n]))/(2*d^7*(d + e*x)^2) - (21*e^3*x*(a + b*Log[c*x^n]))/(d^9*(d
+ e*x)) + (14*e^2*(a + b*Log[c*x^n])^2)/(b*d^9*n) + (341*b*e^2*n*Log[d + e*
x])/(10*d^9) - (28*e^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^9 - (28*b*e^2
*n*PolyLog[2, -((e*x)/d)])/d^9
```

Rule 31

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

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

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex)^7}\,dx = \int\left(\frac{a+b\log(cx^n)}{d^7x^3}-\frac{7e\left(a+b\log(cx^n)\right)}{d^8x^2}+\frac{28e^2\left(a+b\log(cx^n)\right)}{d^9x}-\frac{e^3\left(a+b\log(cx^n)\right)}{d^3(d+ex)^7}\right.$$

$$=\frac{\int\frac{a+b\log(cx^n)}{x^3}\,dx}{d^7}-\frac{(7e)\int\frac{a+b\log(cx^n)}{x^2}\,dx}{d^8}+\frac{\left(28e^2\right)\int\frac{a+b\log(cx^n)}{x}\,dx}{d^9}-\frac{\left(28e^3\right)\int\frac{a+b\log(cx^n)}{d+ex}\,dx}{d^9}$$

$$=-\frac{bn}{4d^7x^2}+\frac{7ben}{d^8x}-\frac{a+b\log(cx^n)}{2d^7x^2}+\frac{7e\left(a+b\log(cx^n)\right)}{d^8x}+\frac{e^2\left(a+b\log(cx^n)\right)}{6d^3(d+ex)^6}+\frac{3e^2\left(a+\right.}{5d^4(}$$

$$=-\frac{bn}{4d^7x^2}+\frac{7ben}{d^8x}-\frac{a+b\log(cx^n)}{2d^7x^2}+\frac{7e\left(a+b\log(cx^n)\right)}{d^8x}+\frac{e^2\left(a+b\log(cx^n)\right)}{6d^3(d+ex)^6}+\frac{3e^2\left(a+\right.}{5d^4(}$$

$$=-\frac{bn}{4d^7x^2}+\frac{7ben}{d^8x}-\frac{be^2n}{30d^4(d+ex)^5}-\frac{23be^2n}{120d^5(d+ex)^4}-\frac{34be^2n}{45d^6(d+ex)^3}-\frac{14be^2n}{5d^7(d+ex)^2}-\frac{1}{10d}$$

Mathematica [A] time = 0.63, size = 486, normalized size = 1.21

$$\frac{10080ae^2\log(cx^n)}{n}+\frac{60ad^6e^2}{(d+ex)^6}+\frac{216ad^5e^2}{(d+ex)^5}+\frac{540ad^4e^2}{(d+ex)^4}+\frac{1200ad^3e^2}{(d+ex)^3}+\frac{2700ad^2e^2}{(d+ex)^2}-\frac{180ad^2}{x^2}+\frac{7560ade^2}{d+ex}-10080ae^2\log\left(\frac{ex}{d}+1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x)^7),x]
```

```
[Out] ((-180*a*d^2)/x^2 - (90*b*d^2*n)/x^2 + (2520*a*d*e)/x + (2520*b*d*e*n)/x +
(60*a*d^6*e^2)/(d + e*x)^6 + (216*a*d^5*e^2)/(d + e*x)^5 - (12*b*d^5*e^2*n)
/(d + e*x)^5 + (540*a*d^4*e^2)/(d + e*x)^4 - (69*b*d^4*e^2*n)/(d + e*x)^4 +
 (1200*a*d^3*e^2)/(d + e*x)^3 - (272*b*d^3*e^2*n)/(d + e*x)^3 + (2700*a*d^2
*e^2)/(d + e*x)^2 - (1008*b*d^2*e^2*n)/(d + e*x)^2 + (7560*a*d*e^2)/(d + e*
x) - (4716*b*d*e^2*n)/(d + e*x) - 12276*b*e^2*n*Log[x] + (10080*a*e^2*Log[c
*x^n])/n - (180*b*d^2*Log[c*x^n])/x^2 + (2520*b*d*e*Log[c*x^n])/x + (60*b*d
^6*e^2*Log[c*x^n])/(d + e*x)^6 + (216*b*d^5*e^2*Log[c*x^n])/(d + e*x)^5 + (
540*b*d^4*e^2*Log[c*x^n])/(d + e*x)^4 + (1200*b*d^3*e^2*Log[c*x^n])/(d + e*
x)^3 + (2700*b*d^2*e^2*Log[c*x^n])/(d + e*x)^2 + (7560*b*d*e^2*Log[c*x^n])/
(d + e*x) + (5040*b*e^2*Log[c*x^n]^2)/n + 12276*b*e^2*n*Log[d + e*x] - 1008
0*a*e^2*Log[1 + (e*x)/d] - 10080*b*e^2*Log[c*x^n]*Log[1 + (e*x)/d] - 10080*
b*e^2*n*PolyLog[2, -((e*x)/d)])/(360*d^9)
```

fricas [F] time = 0.88, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^7x^{10}+7\,de^6x^9+21\,d^2e^5x^8+35\,d^3e^4x^7+35\,d^4e^3x^6+21\,d^5e^2x^5+7\,d^6ex^4+d^7x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^7*x^10 + 7*d*e^6*x^9 + 21*d^2*e^5*x^8 + 35*d
^3*e^4*x^7 + 35*d^4*e^3*x^6 + 21*d^5*e^2*x^5 + 7*d^6*e*x^4 + d^7*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\log\left(cx^n\right)+a}{(ex+d)^7x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^7*x^3), x)
```

maple [C] time = 0.23, size = 1939, normalized size = 4.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(e*x+d)^7,x)
```

```
[Out] 1/4*I*b*Pi*csgn(I*c*x^n)^3/d^7/x^2-1/2*b*ln(x^n)/d^7/x^2+1/6*a*e^2/d^3/(e*x
+d)^6+28*a/d^9*e^2*ln(x)-28*a/d^9*e^2*ln(e*x+d)+7*a/d^8*e/x+21*a/d^8*e^2/(e
*x+d)+15/2*a*e^2/d^7/(e*x+d)^2+10/3*a*e^2/d^6/(e*x+d)^3+3/2*a/d^5*e^2/(e*x+
d)^4+3/5*a/d^4*e^2/(e*x+d)^5-1/2*b*ln(c)/d^7/x^2+15/4*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)^2*e^2/d^7/(e*x+d)^2+7*b*e*n/d^8/x-14*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)/d^9*e^2*ln(x)-1/2*a/d^7/x^2-15/4*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*e^2/d^7/(e*x+d)^2-21/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)/d^8*e^2/(e*x+d)-5/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2
```

```
/d^6/(e*x+d)^3-3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^5*e^2/(e*x+
d)^4+14*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^9*e^2*ln(e*x+d)-1/12*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3/(e*x+d)^6+28*b*n/d^9*e^2*
ln(e*x+d)*ln(-1/d*e*x)+14*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^9*e^2*ln(x)-
14*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^9*e^2*ln(e*x+d)-3/10*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e^2/(e*x+d)^5+3/10*I*b*Pi*csgn(I*c*x^n)^2*
csgn(I*c)/d^4*e^2/(e*x+d)^5+7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^8*e/x+
3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^5*e^2/(e*x+d)^4+1/4*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)/d^7/x^2+341/10*b*e^2*n*ln(e*x+d)/d^9-5/3*I*b*P
i*csgn(I*c*x^n)^3*e^2/d^6/(e*x+d)^3-14*I*b*Pi*csgn(I*c*x^n)^3/d^9*e^2*ln(x)
+14*I*b*Pi*csgn(I*c*x^n)^3/d^9*e^2*ln(e*x+d)-21/2*I*b*Pi*csgn(I*c*x^n)^3/d^
8*e^2/(e*x+d)-15/4*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^7/(e*x+d)^2-1/4*I*b*Pi*csgn
(I*c*x^n)^2*csgn(I*c)/d^7/x^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^7/x^
2-3/4*I*b*Pi*csgn(I*c*x^n)^3/d^5*e^2/(e*x+d)^4-3/10*I*b*Pi*csgn(I*c*x^n)^3/
d^4*e^2/(e*x+d)^5-1/12*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3/(e*x+d)^6-7/2*I*b*Pi*
csgn(I*c*x^n)^3/d^8*e/x-7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^8*
e/x+7/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^8*e/x+15/4*I*b*Pi*csgn(I*c*x^n)^
2*csgn(I*c)*e^2/d^7/(e*x+d)^2+5/3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^6/
(e*x+d)^3+21/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^8*e^2/(e*x+d)+21/2*I*b*
Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^8*e^2/(e*x+d)+21*b*ln(c)/d^8*e^2/(e*x+d)+15/
2*b*ln(c)*e^2/d^7/(e*x+d)^2+10/3*b*ln(c)*e^2/d^6/(e*x+d)^3+3/2*b*ln(c)/d^5*
e^2/(e*x+d)^4+3/5*b*ln(c)/d^4*e^2/(e*x+d)^5+1/6*b*ln(c)*e^2/d^3/(e*x+d)^6-2
8*b*ln(c)/d^9*e^2*ln(e*x+d)+28*b*ln(c)/d^9*e^2*ln(x)+7*b*ln(c)/d^8*e/x+28*b
*ln(x^n)/d^9*e^2*ln(x)+7*b*ln(x^n)/d^8*e/x-28*b*ln(x^n)/d^9*e^2*ln(e*x+d)+2
1*b*ln(x^n)/d^8*e^2/(e*x+d)+15/2*b*ln(x^n)*e^2/d^7/(e*x+d)^2+10/3*b*ln(x^n)
*e^2/d^6/(e*x+d)^3+3/2*b*ln(x^n)/d^5*e^2/(e*x+d)^4+3/5*b*ln(x^n)/d^4*e^2/(e
*x+d)^5+1/6*b*ln(x^n)*e^2/d^3/(e*x+d)^6-14*b*n/d^9*e^2*ln(x)^2+28*b*n/d^9*e
^2*dilog(-1/d*e*x)+1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3/(e*x+d)^
6+5/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^6/(e*x+d)^3+1/12*I*b*Pi*csgn
(I*c*x^n)^2*csgn(I*c)*e^2/d^3/(e*x+d)^6+3/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)/d^5*e^2/(e*x+d)^4+3/10*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e^2/(e*x+d)
^5-14*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^9*e^2*ln(e*x+d)+14*I*b*Pi*csgn(I*c
*x^n)^2*csgn(I*c)/d^9*e^2*ln(x)-1/4*b*n/d^7/x^2-341/10*b*e^2*n*ln(x)/d^9-1/
30*b*e^2*n/d^4/(e*x+d)^5-23/120*b*e^2*n/d^5/(e*x+d)^4-34/45*b*e^2*n/d^6/(e*
x+d)^3-14/5*b*e^2*n/d^7/(e*x+d)^2-131/10*b*e^2*n/d^8/(e*x+d)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{30}a\left(\frac{840\,e^7x^7+4620\,de^6x^6+10360\,d^2e^5x^5+11970\,d^3e^4x^4+7308\,d^4e^3x^3+2058\,d^5e^2x^2+120\,d^6ex-15\,d^7}{d^8e^6x^8+6\,d^9e^5x^7+15\,d^{10}e^4x^6+20\,d^{11}e^3x^5+15\,d^{12}e^2x^4+6\,d^{13}ex^3+d^{14}x^2}-84\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/30*a*((840*e^7*x^7 + 4620*d*e^6*x^6 + 10360*d^2*e^5*x^5 + 11970*d^3*e^4*x
^4 + 7308*d^4*e^3*x^3 + 2058*d^5*e^2*x^2 + 120*d^6*e*x - 15*d^7)/(d^8*e^6*x
^8 + 6*d^9*e^5*x^7 + 15*d^10*e^4*x^6 + 20*d^11*e^3*x^5 + 15*d^12*e^2*x^4 +
6*d^13*e*x^3 + d^14*x^2) - 840*e^2*log(e*x + d)/d^9 + 840*e^2*log(x)/d^9) +
 b*integrate((log(c) + log(x^n))/(e^7*x^10 + 7*d*e^6*x^9 + 21*d^2*e^5*x^8 +
 35*d^3*e^4*x^7 + 35*d^4*e^3*x^6 + 21*d^5*e^2*x^5 + 7*d^6*e*x^4 + d^7*x^3),
 x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,{\left(d+e\,x\right)}^7} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x)^7),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x)^7), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(e*x+d)**7,x)
```

```
[Out] Timed out
```

3.74 $\int \frac{\log(cx)}{1-cx} dx$

Optimal. Leaf size=12

$$\frac{\text{Li}_2(1-cx)}{c}$$

[Out] polylog(2,-c*x+1)/c

Rubi [A] time = 0.01, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2315}

$$\frac{\text{PolyLog}(2,1-cx)}{c}$$

Antiderivative was successfully verified.

[In] Int[Log[c*x]/(1 - c*x),x]

[Out] PolyLog[2, 1 - c*x]/c

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\log(cx)}{1-cx} dx = \frac{\text{Li}_2(1-cx)}{c}$$

Mathematica [A] time = 0.00, size = 12, normalized size = 1.00

$$\frac{\text{Li}_2(1-cx)}{c}$$

Antiderivative was successfully verified.

[In] Integrate[Log[c*x]/(1 - c*x),x]

[Out] PolyLog[2, 1 - c*x]/c

fricas [A] time = 0.84, size = 11, normalized size = 0.92

$$\frac{\text{Li}_2(-cx+1)}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log(c*x)/(-c*x+1),x, algorithm="fricas")

[Out] dilog(-c*x + 1)/c

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{\log(cx)}{cx-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log(c*x)/(-c*x+1),x, algorithm="giac")

```
[Out] integrate(-log(c*x)/(c*x - 1), x)
```

maple [A] time = 0.04, size = 9, normalized size = 0.75

$$\frac{\mathrm{dilog}\left(cx\right)}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(c*x)/(-c*x+1),x)
```

```
[Out] 1/c*dilog(c*x)
```

maxima [B] time = 0.54, size = 48, normalized size = 4.00

$$-\frac{\log\left(cx-1\right)\log\left(cx\right)}{c}+\frac{\log\left(cx-1\right)\log(x)}{c}-\frac{\log\left(-cx+1\right)\log(x)+\mathrm{Li}_2\left(cx\right)}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(c*x)/(-c*x+1),x, algorithm="maxima")
```

```
[Out] -log(c*x - 1)*log(c*x)/c + log(c*x - 1)*log(x)/c - (log(-c*x + 1)*log(x) +
dilog(c*x))/c
```

mupad [B] time = 3.46, size = 8, normalized size = 0.67

$$\frac{\mathrm{Li}_2\left(c\,x\right)}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-log(c*x)/(c*x - 1),x)
```

```
[Out] dilog(c*x)/c
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int\frac{\log\left(cx\right)}{cx-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(c*x)/(-c*x+1),x)
```

```
[Out] -Integral(log(c*x)/(c*x - 1), x)
```

3.75 $\int \frac{\log\left(\frac{x}{c}\right)}{c-x}\,dx$

Optimal. Leaf size=10

$$\text{Li}_2\left(1-\frac{x}{c}\right)$$

```
[Out] polylog(2,1-x/c)
```

Rubi [A] time = 0.01, antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {2315}

$$\text{PolyLog}\left(2,1-\frac{x}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Int[Log[x/c]/(c - x),x]
```

```
[Out] PolyLog[2, 1 - x/c]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\log\left(\frac{x}{c}\right)}{c-x}\,dx = \text{Li}_2\left(1-\frac{x}{c}\right)$$

Mathematica [A] time = 0.00, size = 11, normalized size = 1.10

$$\text{Li}_2\left(\frac{c-x}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[x/c]/(c - x),x]
```

```
[Out] PolyLog[2, (c - x)/c]
```

fricas [A] time = 0.60, size = 9, normalized size = 0.90

$$\text{Li}_2\left(-\frac{x}{c}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x/c)/(c-x),x, algorithm="fricas")
```

```
[Out] dilog(-x/c + 1)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log\left(\frac{x}{c}\right)}{c-x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x/c)/(c-x),x, algorithm="giac")
[Out] integrate(log(x/c)/(c - x), x)
```

maple [A] time = 0.03, size = 7, normalized size = 0.70

$$\text{dilog}\left(\frac{x}{c}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(x/c)/(c-x),x)
[Out] dilog(x/c)
```

maxima [B] time = 0.57, size = 45, normalized size = 4.50

$$\log\left(c-x\right)\log(x)-\log\left(c-x\right)\log\left(\frac{x}{c}\right)-\log(x)\log\left(-\frac{x}{c}+1\right)-\text{Li}_2\left(\frac{x}{c}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x/c)/(c-x),x, algorithm="maxima")
[Out] log(c - x)*log(x) - log(c - x)*log(x/c) - log(x)*log(-x/c + 1) - dilog(x/c)
```

mupad [B] time = 3.50, size = 6, normalized size = 0.60

$$\text{Li}_2\left(\frac{x}{c}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(x/c)/(c - x),x)
[Out] dilog(x/c)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int\frac{\log\left(\frac{x}{c}\right)}{-c+x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(x/c)/(c-x),x)
[Out] -Integral(log(x/c)/(-c + x), x)
```

3.76 $\int x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)^2\,dx$

Optimal. Leaf size=109

$$\frac{1}{3}dx^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{2}{9}bdnx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}ex^4\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{8}benx^4\left(a+b\log\left(cx^n\right)\right)+\frac{2}{27}b^2dn^2x^3$$

```
[Out] 2/27*b^2*d*n^2*x^3+1/32*b^2*e*n^2*x^4-2/9*b*d*n*x^3*(a+b*ln(c*x^n))-1/8*b*e
*n*x^4*(a+b*ln(c*x^n))+1/3*d*x^3*(a+b*ln(c*x^n))^2+1/4*e*x^4*(a+b*ln(c*x^n)
)^2
```

Rubi [A] time = 0.14, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2353, 2305, 2304}

$$\frac{1}{3}dx^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{2}{9}bdnx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}ex^4\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{8}benx^4\left(a+b\log\left(cx^n\right)\right)+\frac{2}{27}b^2dn^2x^3$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b^2*d*n^2*x^3)/27 + (b^2*e*n^2*x^4)/32 - (2*b*d*n*x^3*(a + b*Log[c*x^n])
)/9 - (b*e*n*x^4*(a + b*Log[c*x^n]))/8 + (d*x^3*(a + b*Log[c*x^n])^2)/3 + (
e*x^4*(a + b*Log[c*x^n])^2)/4
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\begin{aligned}\int x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)^2\,dx &= \int\left(dx^2\left(a+b\log\left(cx^n\right)\right)^2+ex^3\left(a+b\log\left(cx^n\right)\right)^2\right)dx\\ &= d\int x^2\left(a+b\log\left(cx^n\right)\right)^2\,dx+e\int x^3\left(a+b\log\left(cx^n\right)\right)^2\,dx\\ &= \frac{1}{3}dx^3\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{4}ex^4\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{3}(2bdn)\int x^2\left(a+b\log\right.\\ &= \frac{2}{27}b^2dn^2x^3+\frac{1}{32}b^2en^2x^4-\frac{2}{9}bdnx^3\left(a+b\log\left(cx^n\right)\right)-\frac{1}{8}benx^4\left(a+b\log(cx\right.\end{aligned}$$

Mathematica [A] time = 0.06, size = 82, normalized size = 0.75

$$\frac{1}{864}x^3\left(288d\left(a+b\log\left(cx^n\right)\right)^2+64bdn\left(-3a-3b\log\left(cx^n\right)+bn\right)+216ex\left(a+b\log\left(cx^n\right)\right)^2+27benx\left(-4a-\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (x^3*(27*b*e*n*x*(-4*a + b*n - 4*b*Log[c*x^n]) + 64*b*d*n*(-3*a + b*n - 3*b
*Log[c*x^n]) + 288*d*(a + b*Log[c*x^n])^2 + 216*e*x*(a + b*Log[c*x^n])^2))/
864
```

fricas [B] time = 0.71, size = 219, normalized size = 2.01

$$\frac{1}{32}\left(b^2en^2-4\,aben+8\,a^2e\right)x^4+\frac{1}{27}\left(2\,b^2dn^2-6\,abdn+9\,a^2d\right)x^3+\frac{1}{12}\left(3\,b^2ex^4+4\,b^2dx^3\right)\log(c)^2+\frac{1}{12}\left(3\,b^2en^2x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x+d)*(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] 1/32*(b^2*e*n^2 - 4*a*b*e*n + 8*a^2*e)*x^4 + 1/27*(2*b^2*d*n^2 - 6*a*b*d*n
+ 9*a^2*d)*x^3 + 1/12*(3*b^2*e*x^4 + 4*b^2*d*x^3)*log(c)^2 + 1/12*(3*b^2*e*
n^2*x^4 + 4*b^2*d*n^2*x^3)*log(x)^2 - 1/72*(9*(b^2*e*n - 4*a*b*e)*x^4 + 16*
(b^2*d*n - 3*a*b*d)*x^3)*log(c) - 1/72*(9*(b^2*e*n^2 - 4*a*b*e*n)*x^4 + 16*
(b^2*d*n^2 - 3*a*b*d*n)*x^3 - 12*(3*b^2*e*n*x^4 + 4*b^2*d*n*x^3)*log(c))*lo
g(x)
```

giac [B] time = 0.39, size = 251, normalized size = 2.30

$$\frac{1}{4}\,b^2n^2x^4e\log(x)^2-\frac{1}{8}\,b^2n^2x^4e\log(x)+\frac{1}{2}\,b^2nx^4e\log(c)\log(x)+\frac{1}{3}\,b^2dn^2x^3\log(x)^2+\frac{1}{32}\,b^2n^2x^4e-\frac{1}{8}\,b^2nx^4e\log(c)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x+d)*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] 1/4*b^2*n^2*x^4*e*log(x)^2 - 1/8*b^2*n^2*x^4*e*log(x) + 1/2*b^2*n*x^4*e*log
(c)*log(x) + 1/3*b^2*d*n^2*x^3*log(x)^2 + 1/32*b^2*n^2*x^4*e - 1/8*b^2*n*x^
4*e*log(c) + 1/4*b^2*x^4*e*log(c)^2 - 2/9*b^2*d*n^2*x^3*log(x) + 1/2*a*b*n*
x^4*e*log(x) + 2/3*b^2*d*n*x^3*log(c)*log(x) + 2/27*b^2*d*n^2*x^3 - 1/8*a*b
*n*x^4*e - 2/9*b^2*d*n*x^3*log(c) + 1/2*a*b*x^4*e*log(c) + 1/3*b^2*d*x^3*lo
g(c)^2 + 2/3*a*b*d*n*x^3*log(x) - 2/9*a*b*d*n*x^3 + 1/4*a^2*x^4*e + 2/3*a*b
*d*x^3*log(c) + 1/3*a^2*d*x^3
```

maple [C] time = 0.28, size = 1622, normalized size = 14.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x+d)*(b*ln(c*x^n)+a)^2,x)
```

```
[Out] -2/9*a*b*d*n*x^3-1/8*a*b*e*n*x^4-2/9*ln(c)*b^2*d*n*x^3+2/3*ln(c)*a*b*d*x^3-
1/8*ln(c)*b^2*e*n*x^4+1/2*ln(c)*a*b*e*x^4+1/72*b*(18*I*Pi*b*e*x^4*csgn(I*x^
n)*csgn(I*c*x^n)^2-18*I*Pi*b*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*I
*Pi*b*e*x^4*csgn(I*c*x^n)^3+18*I*Pi*b*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)+36*b*
e*x^4*ln(c)-9*b*e*n*x^4+36*a*e*x^4+24*I*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n
)^2-24*I*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-24*I*Pi*b*d*x^3*csg
n(I*c*x^n)^3+24*I*Pi*b*d*x^3*csgn(I*c*x^n)^2*csgn(I*c)+48*b*d*x^3*ln(c)-16*
b*d*n*x^3+48*a*d*x^3)*ln(x^n)+1/3*ln(c)^2*b^2*d*x^3+1/4*ln(c)^2*b^2*e*x^4-1
/4*I*Pi*a*b*e*x^4*csgn(I*c*x^n)^3-1/3*I*ln(c)*Pi*b^2*d*x^3*csgn(I*c*x^n)^3+
```

```
1/4*a^2*e*x^4+1/12*b^2*x^3*(3*e*x+4*d)*ln(x^n)^2+1/3*a^2*d*x^3+1/3*I*Pi*a*b
*d*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*ln(c)*Pi*b^2*e*x^4*csgn(I*x^n)*csgn(
I*c*x^n)^2-1/9*I*Pi*b^2*d*n*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1/9*I*Pi*b^2*d*
n*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*I*Pi*a*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n
)^2+1/6*Pi^2*b^2*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)^5+1/6*Pi^2*b^2*d*x^3*csgn(
I*c*x^n)^5*csgn(I*c)-1/12*Pi^2*b^2*d*x^3*csgn(I*c*x^n)^4*csgn(I*c)^2+1/9*I*
Pi*b^2*d*n*x^3*csgn(I*c*x^n)^3-1/3*I*Pi*a*b*d*x^3*csgn(I*c*x^n)^3-1/4*I*ln(
c)*Pi*b^2*e*x^4*csgn(I*c*x^n)^3-1/12*Pi^2*b^2*d*x^3*csgn(I*x^n)^2*csgn(I*c*
x^n)^2*csgn(I*c)^2-1/16*Pi^2*b^2*e*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/8*Pi
^2*b^2*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^5+1/8*Pi^2*b^2*e*x^4*csgn(I*c*x^n)^5
*csgn(I*c)-1/16*Pi^2*b^2*e*x^4*csgn(I*c*x^n)^4*csgn(I*c)^2-1/12*Pi^2*b^2*d*
x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/9*I*Pi*b^2*d*n*x^3*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)-1/3*I*Pi*a*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/16
*Pi^2*b^2*e*x^4*csgn(I*c*x^n)^6-1/12*Pi^2*b^2*d*x^3*csgn(I*c*x^n)^6-1/16*I*
Pi*b^2*e*n*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*Pi*a*b*e*x^4*csgn(I*x^n)*csg
n(I*c*x^n)^2+1/4*I*Pi*a*b*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*ln(c)*Pi*b^
2*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1/16*I*Pi*b^2*e*n*x^4*csgn(I*x^n)*csgn(I*
c*x^n)^2+1/3*I*ln(c)*Pi*b^2*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I*ln(c)*P
i*b^2*d*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/4*I*Pi*a*b*e*x^4*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)-1/3*I*ln(c)*Pi*b^2*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)-1/4*I*ln(c)*Pi*b^2*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/16*I*Pi*
b^2*e*n*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2/27*b^2*d*n^2*x^3+1/32*b^2
*e*n^2*x^4-1/16*Pi^2*b^2*e*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/
4*Pi^2*b^2*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/8*Pi^2*b^2*e*x^4*c
sgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-1/3*Pi^2*b^2*d*x^3*csgn(I*x^n)*csgn(
I*c*x^n)^4*csgn(I*c)+1/6*Pi^2*b^2*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*
c)^2+1/6*Pi^2*b^2*d*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+1/8*Pi^2*b^
2*e*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+1/16*I*Pi*b^2*e*n*x^4*csgn(
I*c*x^n)^3
```

maxima [A] time = 0.60, size = 151, normalized size = 1.39

$$\frac{1}{4}b^2ex^4\log(cx^n)^2-\frac{1}{8}abenx^4+\frac{1}{2}abex^4\log(cx^n)+\frac{1}{3}b^2dx^3\log(cx^n)^2-\frac{2}{9}abdnx^3+\frac{1}{4}a^2ex^4+\frac{2}{3}abdx^3\log(cx^n)+\frac{1}{3}a^2d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x+d)*(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] 1/4*b^2*e*x^4*log(c*x^n)^2 - 1/8*a*b*e*n*x^4 + 1/2*a*b*e*x^4*log(c*x^n) + 1
/3*b^2*d*x^3*log(c*x^n)^2 - 2/9*a*b*d*n*x^3 + 1/4*a^2*e*x^4 + 2/3*a*b*d*x^3
*log(c*x^n) + 1/3*a^2*d*x^3 + 2/27*(n^2*x^3 - 3*n*x^3*log(c*x^n))*b^2*d + 1
/32*(n^2*x^4 - 4*n*x^4*log(c*x^n))*b^2*e
```

mupad [B] time = 3.58, size = 116, normalized size = 1.06

$$\ln(c\,x^n)^2\left(\frac{e\,b^2\,x^4}{4}+\frac{d\,b^2\,x^3}{3}\right)+\ln(c\,x^n)\left(\frac{b\,e\,(4\,a-b\,n)\,x^4}{8}+\frac{2\,b\,d\,(3\,a-b\,n)\,x^3}{9}\right)+\frac{d\,x^3\,\left(9\,a^2-6\,a\,b\,n+2\,b^2\,n^2\right)}{27}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*log(c*x^n))^2*(d + e*x),x)
```

```
[Out] log(c*x^n)^2*((b^2*d*x^3)/3 + (b^2*e*x^4)/4) + log(c*x^n)*((2*b*d*x^3*(3*a
- b*n))/9 + (b*e*x^4*(4*a - b*n))/8) + (d*x^3*(9*a^2 + 2*b^2*n^2 - 6*a*b*n)
)/27 + (e*x^4*(8*a^2 + b^2*n^2 - 4*a*b*n))/32
```

sympy [B] time = 2.75, size = 309, normalized size = 2.83

$$\frac{a^2dx^3}{3}+\frac{a^2ex^4}{4}+\frac{2abdnx^3\log(x)}{3}-\frac{2abdnx^3}{9}+\frac{2abdx^3\log(c)}{3}+\frac{abenx^4\log(x)}{2}-\frac{abenx^4}{8}+\frac{abex^4\log(c)}{2}+\frac{b^2dn^2x^3\log}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x+d)*(a+b*ln(c*x**n))**2,x)
```

```
[Out] a**2*d*x**3/3 + a**2*e*x**4/4 + 2*a*b*d*n*x**3*log(x)/3 - 2*a*b*d*n*x**3/9
+ 2*a*b*d*x**3*log(c)/3 + a*b*e*n*x**4*log(x)/2 - a*b*e*n*x**4/8 + a*b*e*x*
*4*log(c)/2 + b**2*d*n**2*x**3*log(x)**2/3 - 2*b**2*d*n**2*x**3*log(x)/9 +
2*b**2*d*n**2*x**3/27 + 2*b**2*d*n*x**3*log(c)*log(x)/3 - 2*b**2*d*n*x**3*l
og(c)/9 + b**2*d*x**3*log(c)**2/3 + b**2*e*n**2*x**4*log(x)**2/4 - b**2*e*n
**2*x**4*log(x)/8 + b**2*e*n**2*x**4/32 + b**2*e*n*x**4*log(c)*log(x)/2 - b
**2*e*n*x**4*log(c)/8 + b**2*e*x**4*log(c)**2/4
```

3.77 $\int x(d+ex)\left(a+b\log\left(cx^n\right)\right)^2\,dx$

Optimal. Leaf size=109

$$\frac{1}{2}dx^2\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{2}bdnx^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}ex^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{2}{9}benx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}b^2dn^2x^2+$$

```
[Out] 1/4*b^2*d*n^2*x^2+2/27*b^2*e*n^2*x^3-1/2*b*d*n*x^2*(a+b*ln(c*x^n))-2/9*b*e*
n*x^3*(a+b*ln(c*x^n))+1/2*d*x^2*(a+b*ln(c*x^n))^2+1/3*e*x^3*(a+b*ln(c*x^n))
^2
```

Rubi [A] time = 0.11, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2353, 2305, 2304}

$$\frac{1}{2}dx^2\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{2}bdnx^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}ex^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{2}{9}benx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}b^2dn^2x^2+$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (b^2*d*n^2*x^2)/4 + (2*b^2*e*n^2*x^3)/27 - (b*d*n*x^2*(a + b*Log[c*x^n]))/2
 - (2*b*e*n*x^3*(a + b*Log[c*x^n]))/9 + (d*x^2*(a + b*Log[c*x^n])^2)/2 + (e
*x^3*(a + b*Log[c*x^n])^2)/3
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\begin{aligned}
\int x(d+ex)\left(a+b\log\left(cx^n\right)\right)^2\,dx &= \int \left(dx\left(a+b\log\left(cx^n\right)\right)^2+ex^2\left(a+b\log\left(cx^n\right)\right)^2\right)dx\\
&= d\int x\left(a+b\log\left(cx^n\right)\right)^2\,dx+e\int x^2\left(a+b\log\left(cx^n\right)\right)^2\,dx\\
&= \frac{1}{2}dx^2\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{3}ex^3\left(a+b\log\left(cx^n\right)\right)^2-(bdn)\int x\left(a+b\log\left(cx^n\right.\right.\\
&= \frac{1}{4}b^2dn^2x^2+\frac{2}{27}b^2en^2x^3-\frac{1}{2}bdnx^2\left(a+b\log\left(cx^n\right)\right)-\frac{2}{9}benx^3\left(a+b\log\left(cx^n\right)\right.
\end{aligned}$$

Mathematica [A] time = 0.06, size = 82, normalized size = 0.75

$$\frac{1}{108}x^2\left(54d\left(a+b\log\left(cx^n\right)\right)^2+27bdn\left(-2a-2b\log\left(cx^n\right)+bn\right)+36ex\left(a+b\log\left(cx^n\right)\right)^2+8benx\left(-3a-3b\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (x^2*(8*b*e*n*x*(-3*a + b*n - 3*b*Log[c*x^n]) + 27*b*d*n*(-2*a + b*n - 2*b*
Log[c*x^n]) + 54*d*(a + b*Log[c*x^n])^2 + 36*e*x*(a + b*Log[c*x^n])^2))/108
```

fricas [B] time = 0.69, size = 219, normalized size = 2.01

$$\frac{1}{27}\left(2\,b^2en^2-6\,aben+9\,a^2e\right)x^3+\frac{1}{4}\left(b^2dn^2-2\,abdn+2\,a^2d\right)x^2+\frac{1}{6}\left(2\,b^2ex^3+3\,b^2dx^2\right)\log(c)^2+\frac{1}{6}\left(2\,b^2en^2x^3+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)*(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] 1/27*(2*b^2*e*n^2 - 6*a*b*e*n + 9*a^2*e)*x^3 + 1/4*(b^2*d*n^2 - 2*a*b*d*n +
 2*a^2*d)*x^2 + 1/6*(2*b^2*e*x^3 + 3*b^2*d*x^2)*log(c)^2 + 1/6*(2*b^2*e*n^2
*x^3 + 3*b^2*d*n^2*x^2)*log(x)^2 - 1/18*(4*(b^2*e*n - 3*a*b*e)*x^3 + 9*(b^2
*d*n - 2*a*b*d)*x^2)*log(c) - 1/18*(4*(b^2*e*n^2 - 3*a*b*e*n)*x^3 + 9*(b^2*
d*n^2 - 2*a*b*d*n)*x^2 - 6*(2*b^2*e*n*x^3 + 3*b^2*d*n*x^2)*log(c))*log(x)
```

giac [B] time = 0.26, size = 248, normalized size = 2.28

$$\frac{1}{3}\,b^2n^2x^3e\log(x)^2-\frac{2}{9}\,b^2n^2x^3e\log(x)+\frac{2}{3}\,b^2nx^3e\log(c)\log(x)+\frac{1}{2}\,b^2dn^2x^2\log(x)^2+\frac{2}{27}\,b^2n^2x^3e-\frac{2}{9}\,b^2nx^3e\log(c)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] 1/3*b^2*n^2*x^3*e*log(x)^2 - 2/9*b^2*n^2*x^3*e*log(x) + 2/3*b^2*n*x^3*e*log
(c)*log(x) + 1/2*b^2*d*n^2*x^2*log(x)^2 + 2/27*b^2*n^2*x^3*e - 2/9*b^2*n*x^
3*e*log(c) + 1/3*b^2*x^3*e*log(c)^2 - 1/2*b^2*d*n^2*x^2*log(x) + 2/3*a*b*n*
x^3*e*log(x) + b^2*d*n*x^2*log(c)*log(x) + 1/4*b^2*d*n^2*x^2 - 2/9*a*b*n*x^
3*e - 1/2*b^2*d*n*x^2*log(c) + 2/3*a*b*x^3*e*log(c) + 1/2*b^2*d*x^2*log(c)^
2 + a*b*d*n*x^2*log(x) - 1/2*a*b*d*n*x^2 + 1/3*a^2*x^3*e + a*b*d*x^2*log(c)
 + 1/2*a^2*d*x^2
```

maple [C] time = 0.27, size = 1621, normalized size = 14.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x+d)*(b*ln(c*x^n)+a)^2,x)
```

```
[Out] -2/9*b*n*a*e*x^3-1/2*b*n*a*d*x^2+1/3*a^2*e*x^3+1/2*a^2*d*x^2+1/18*b*(6*I*Pi
*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-6*I*Pi*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)-6*I*Pi*b*e*x^3*csgn(I*c*x^n)^3+6*I*Pi*b*e*x^3*csgn(I*c*x^n)^2*
csgn(I*c)+12*b*e*x^3*ln(c)-4*b*e*n*x^3+12*a*e*x^3+9*I*Pi*b*d*x^2*csgn(I*x^n
)*csgn(I*c*x^n)^2-9*I*Pi*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi
*b*d*x^2*csgn(I*c*x^n)^3+9*I*Pi*b*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)+18*b*d*x^
2*ln(c)-9*b*d*n*x^2+18*a*d*x^2)*ln(x^n)+1/3*ln(c)^2*b^2*e*x^3+1/2*ln(c)^2*b
^2*d*x^2+1/6*b^2*x^2*(2*e*x+3*d)*ln(x^n)^2-1/9*I*Pi*b^2*e*n*x^3*csgn(I*c*x^
n)^2*csgn(I*c)+1/3*I*Pi*a*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-2/9*ln(c)*b^2
*e*n*x^3+2/3*ln(c)*a*b*e*x^3-1/2*ln(c)*b^2*d*n*x^2+ln(c)*a*b*d*x^2+1/3*I*ln
(c)*Pi*b^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/6*Pi^2*b^2*e*x^3*csgn(I*x^n)
```

```
*csgn(I*c*x^n)^3*csgn(I*c)^2-1/2*Pi^2*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^4
*csgn(I*c)+1/4*Pi^2*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/4*P
i^2*b^2*d*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/9*I*Pi*b^2*e*n*x^3*
csgn(I*x^n)*csgn(I*c*x^n)^2-1/3*I*ln(c)*Pi*b^2*e*x^3*csgn(I*c*x^n)^3+1/9*I*
Pi*b^2*e*n*x^3*csgn(I*c*x^n)^3-1/3*I*Pi*a*b*e*x^3*csgn(I*c*x^n)^3-1/2*I*ln(
c)*Pi*b^2*d*x^2*csgn(I*c*x^n)^3+1/4*Pi^2*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n
)^5+1/4*Pi^2*b^2*d*x^2*csgn(I*c*x^n)^5*csgn(I*c)-1/8*Pi^2*b^2*d*x^2*csgn(I*
c*x^n)^4*csgn(I*c)^2-1/12*Pi^2*b^2*e*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/6*
Pi^2*b^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^5+1/6*Pi^2*b^2*e*x^3*csgn(I*c*x^n)
^5*csgn(I*c)-1/12*Pi^2*b^2*e*x^3*csgn(I*c*x^n)^4*csgn(I*c)^2-1/8*Pi^2*b^2*d
*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4-1/8*Pi^2*b^2*d*x^2*csgn(I*c*x^n)^6-1/12*
Pi^2*b^2*e*x^3*csgn(I*c*x^n)^6+1/2*I*ln(c)*Pi*b^2*d*x^2*csgn(I*x^n)*csgn(I*
c*x^n)^2+1/2*I*ln(c)*Pi*b^2*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)-1/4*I*Pi*b^2*d*
n*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I*Pi*a*b*e*x^3*csgn(I*c*x^n)^2*csgn(I
*c)+1/3*I*ln(c)*Pi*b^2*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/4*I*Pi*b^2*d*n*x^2
*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*Pi*a*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1
/2*I*Pi*a*b*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*ln(c)*Pi*b^2*d*x^2*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi*b^2*d*n*x^2*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)-1/3*I*ln(c)*Pi*b^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/
9*I*Pi*b^2*e*n*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*I*Pi*a*b*e*x^3*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*a*b*d*x^2*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)+1/4*b^2*d*n^2*x^2+2/27*b^2*e*n^2*x^3-1/8*Pi^2*b^2*d*x^2*csgn
(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+1/4*I*Pi*b^2*d*n*x^2*csgn(I*c*x^n)^3+
1/6*Pi^2*b^2*e*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/12*Pi^2*b^2*e*
x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/3*Pi^2*b^2*e*x^3*csgn(I*x^n
)*csgn(I*c*x^n)^4*csgn(I*c)-1/2*I*Pi*a*b*d*x^2*csgn(I*c*x^n)^3
```

maxima [A] time = 0.56, size = 150, normalized size = 1.38

$$\frac{1}{3}b^2ex^3\log(cx^n)^2-\frac{2}{9}abenx^3+\frac{2}{3}abex^3\log(cx^n)+\frac{1}{2}b^2dx^2\log(cx^n)^2-\frac{1}{2}abdnx^2+\frac{1}{3}a^2ex^3+abdx^2\log(cx^n)+\frac{1}{2}a^2dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)*(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] 1/3*b^2*e*x^3*log(c*x^n)^2 - 2/9*a*b*e*n*x^3 + 2/3*a*b*e*x^3*log(c*x^n) + 1
/2*b^2*d*x^2*log(c*x^n)^2 - 1/2*a*b*d*n*x^2 + 1/3*a^2*e*x^3 + a*b*d*x^2*log
(c*x^n) + 1/2*a^2*d*x^2 + 1/4*(n^2*x^2 - 2*n*x^2*log(c*x^n))*b^2*d + 2/27*(
n^2*x^3 - 3*n*x^3*log(c*x^n))*b^2*e
```

mupad [B] time = 3.53, size = 116, normalized size = 1.06

$$\ln(c\,x^n)^2\,\left(\frac{e\,b^2\,x^3}{3}+\frac{d\,b^2\,x^2}{2}\right)+\ln(c\,x^n)\,\left(\frac{2\,b\,e\,(3\,a-b\,n)\,x^3}{9}+\frac{b\,d\,(2\,a-b\,n)\,x^2}{2}\right)+\frac{d\,x^2\,\left(2\,a^2-2\,a\,b\,n+b^2\,n^2\right)}{4}+\frac{e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*log(c*x^n))^2*(d + e*x),x)
```

```
[Out] log(c*x^n)^2*((b^2*d*x^2)/2 + (b^2*e*x^3)/3) + log(c*x^n)*((b*d*x^2*(2*a -
b*n))/2 + (2*b*e*x^3*(3*a - b*n))/9) + (d*x^2*(2*a^2 + b^2*n^2 - 2*a*b*n))/
4 + (e*x^3*(9*a^2 + 2*b^2*n^2 - 6*a*b*n))/27
```

sympy [B] time = 1.80, size = 304, normalized size = 2.79

$$\frac{a^2dx^2}{2}+\frac{a^2ex^3}{3}+abdnx^2\log(x)-\frac{abdnx^2}{2}+abdx^2\log(c)+\frac{2abenx^3\log(x)}{3}-\frac{2abenx^3}{9}+\frac{2abex^3\log(c)}{3}+\frac{b^2dn^2x^2\log(}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)*(a+b*ln(c*x**n))**2,x)
```

```
[Out] a**2*d*x**2/2 + a**2*e*x**3/3 + a*b*d*n*x**2*log(x) - a*b*d*n*x**2/2 + a*b*
d*x**2*log(c) + 2*a*b*e*n*x**3*log(x)/3 - 2*a*b*e*n*x**3/9 + 2*a*b*e*x**3*l
og(c)/3 + b**2*d*n**2*x**2*log(x)**2/2 - b**2*d*n**2*x**2*log(x)/2 + b**2*d
*n**2*x**2/4 + b**2*d*n*x**2*log(c)*log(x) - b**2*d*n*x**2*log(c)/2 + b**2*
d*x**2*log(c)**2/2 + b**2*e*n**2*x**3*log(x)**2/3 - 2*b**2*e*n**2*x**3*log(
x)/9 + 2*b**2*e*n**2*x**3/27 + 2*b**2*e*n*x**3*log(c)*log(x)/3 - 2*b**2*e*n
*x**3*log(c)/9 + b**2*e*x**3*log(c)**2/3
```

3.78 $\int (d + ex) \left(a + b \log \left(cx^n\right)\right)^2 dx$

Optimal. Leaf size=101

$$dx\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{2}benx^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}ex^2\left(a+b\log\left(cx^n\right)\right)^2-2abdnx-2b^2dnx\log\left(cx^n\right)+2b^2dn^2x+\frac{1}{4}b$$

```
[Out] -2*a*b*d*n*x+2*b^2*d*n^2*x+1/4*b^2*e*n^2*x^2-2*b^2*d*n*x*ln(c*x^n)-1/2*b*e*
n*x^2*(a+b*ln(c*x^n))+d*x*(a+b*ln(c*x^n))^2+1/2*e*x^2*(a+b*ln(c*x^n))^2
```

Rubi [A] time = 0.07, antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {2330, 2296, 2295, 2305, 2304}

$$dx\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{2}benx^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}ex^2\left(a+b\log\left(cx^n\right)\right)^2-2abdnx-2b^2dnx\log\left(cx^n\right)+2b^2dn^2x+\frac{1}{4}b$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] -2*a*b*d*n*x + 2*b^2*d*n^2*x + (b^2*e*n^2*x^2)/4 - 2*b^2*d*n*x*Log[c*x^n] -
 (b*e*n*x^2*(a + b*Log[c*x^n]))/2 + d*x*(a + b*Log[c*x^n])^2 + (e*x^2*(a +
b*Log[c*x^n])^2)/2
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rubi steps

$$\int (d+ex)\left(a+b\log\left(cx^n\right)\right)^2\,dx = \int \left(d\left(a+b\log\left(cx^n\right)\right)^2+ex\left(a+b\log\left(cx^n\right)\right)^2\right)dx$$
$$= d\int \left(a+b\log\left(cx^n\right)\right)^2\,dx + e\int x\left(a+b\log\left(cx^n\right)\right)^2\,dx$$
$$= dx\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{2}ex^2\left(a+b\log\left(cx^n\right)\right)^2-(2bdn)\int \left(a+b\log\left(cx^n\right)\right)$$
$$= -2abdnx+\frac{1}{4}b^2en^2x^2-\frac{1}{2}benx^2\left(a+b\log\left(cx^n\right)\right)+dx\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{2}$$
$$= -2abdnx+2b^2dn^2x+\frac{1}{4}b^2en^2x^2-2b^2dnx\log\left(cx^n\right)-\frac{1}{2}benx^2\left(a+b\log\left(cx\right.\right.$$

Mathematica [A] time = 0.05, size = 77, normalized size = 0.76

$$\frac{1}{4}x\left(4d\left(a+b\log\left(cx^n\right)\right)^2-8bdn\left(a+b\log\left(cx^n\right)-bn\right)+2ex\left(a+b\log\left(cx^n\right)\right)^2+benx\left(-2a-2b\log\left(cx^n\right)+b\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (x*(b*e*n*x*(-2*a + b*n - 2*b*Log[c*x^n]) + 4*d*(a + b*Log[c*x^n])^2 + 2*e*
x*(a + b*Log[c*x^n])^2 - 8*b*d*n*(a - b*n + b*Log[c*x^n])))/4
```

fricas [B] time = 0.45, size = 200, normalized size = 1.98

$$\frac{1}{4}\left(b^2en^2-2\,aben+2\,a^2e\right)x^2+\frac{1}{2}\left(b^2ex^2+2\,b^2dx\right)\log(c)^2+\frac{1}{2}\left(b^2en^2x^2+2\,b^2dn^2x\right)\log(x)^2+\left(2\,b^2dn^2-2\,abdn\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] 1/4*(b^2*e*n^2 - 2*a*b*e*n + 2*a^2*e)*x^2 + 1/2*(b^2*e*x^2 + 2*b^2*d*x)*log
(c)^2 + 1/2*(b^2*e*n^2*x^2 + 2*b^2*d*n^2*x)*log(x)^2 + (2*b^2*d*n^2 - 2*a*b
*d*n + a^2*d)*x - 1/2*((b^2*e*n - 2*a*b*e)*x^2 + 4*(b^2*d*n - a*b*d)*x)*log
(c) - 1/2*((b^2*e*n^2 - 2*a*b*e*n)*x^2 + 4*(b^2*d*n^2 - a*b*d*n)*x - 2*(b^2
*e*n*x^2 + 2*b^2*d*n*x)*log(c))*log(x)
```

giac [B] time = 0.35, size = 225, normalized size = 2.23

$$\frac{1}{2}\,b^2n^2x^2e\log(x)^2-\frac{1}{2}\,b^2n^2x^2e\log(x)+b^2nx^2e\log(c)\log(x)+b^2dn^2x\log(x)^2+\frac{1}{4}\,b^2n^2x^2e-\frac{1}{2}\,b^2nx^2e\log(c)+\frac{1}{2}\,b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] 1/2*b^2*n^2*x^2*e*log(x)^2 - 1/2*b^2*n^2*x^2*e*log(x) + b^2*n*x^2*e*log(c)*
log(x) + b^2*d*n^2*x*log(x)^2 + 1/4*b^2*n^2*x^2*e - 1/2*b^2*n*x^2*e*log(c)
+ 1/2*b^2*x^2*e*log(c)^2 - 2*b^2*d*n^2*x*log(x) + a*b*n*x^2*e*log(x) + 2*b^
2*d*n*x*log(c)*log(x) + 2*b^2*d*n^2*x - 1/2*a*b*n*x^2*e - 2*b^2*d*n*x*log(c
) + a*b*x^2*e*log(c) + b^2*d*x*log(c)^2 + 2*a*b*d*n*x*log(x) - 2*a*b*d*n*x
+ 1/2*a^2*x^2*e + 2*a*b*d*x*log(c) + a^2*d*x
```

maple [C] time = 0.28, size = 1548, normalized size = 15.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(b*ln(c*x^n)+a)^2,x)
```

```
[Out] -1/2*b*n*a*e*x^2+1/2*a^2*e*x^2+1/2*ln(c)^2*b^2*e*x^2+ln(c)^2*b^2*d*x+1/2*b^
2*x*(e*x+2*d)*ln(x^n)^2+a^2*d*x+1/2*b*(I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^
n)^2-I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*e*x^2*csgn(I*c
*x^n)^3+I*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b*d*csgn(I*x^n)*csgn(
I*c*x^n)^2*x-2*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-2*I*Pi*b*d*cs
gn(I*c*x^n)^3*x+2*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*x+2*ln(c)*b*e*x^2-b*e*
n*x^2+4*ln(c)*b*d*x+2*a*e*x^2-4*b*d*n*x+4*a*d*x)*ln(x^n)-1/2*b^2*n*ln(c)*e*
x^2+ln(c)*a*b*e*x^2+2*ln(c)*a*b*d*x-2*b^2*n*ln(c)*d*x+1/2*I*ln(c)*Pi*b^2*e*
x^2*csgn(I*c*x^n)^2*csgn(I*c)+I*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2*
x-I*b^2*n*Pi*d*csgn(I*x^n)*csgn(I*c*x^n)^2*x-I*b^2*n*Pi*d*csgn(I*c*x^n)^2*c
sgn(I*c)*x+I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)*x-Pi^2*b^2*d*csgn(I*x
^n)*csgn(I*c*x^n)^4*csgn(I*c)*x+1/2*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^3*
csgn(I*c)^2*x-1/8*Pi^2*b^2*e*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+
I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*x+I*Pi*a*b*d*csgn(I*c*x^n)^2*csgn(I*
c)*x-I*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-I*Pi*a*b*d*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+I*b^2*n*Pi*d*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*x-1/8*Pi^2*b^2*e*x^2*csgn(I*c*x^n)^6-1/4*Pi^2*b^2*d*csgn(I*c*x^n)^6
*x-1/4*I*b^2*n*Pi*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*b^2*n*Pi*e*x^2*cs
gn(I*c*x^n)^2*csgn(I*c)+1/2*I*Pi*a*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*
ln(c)*Pi*b^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*Pi*a*b*e*x^2*csgn(I*x^
n)*csgn(I*c*x^n)^2+1/4*I*b^2*n*Pi*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
-1/2*I*ln(c)*Pi*b^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*a*b*
e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*Pi^2*b^2*e*x^2*csgn(I*x^n)*cs
gn(I*c*x^n)^3*csgn(I*c)^2+1/2*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn
(I*c)*x-1/4*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x+2*b^2*d*
n^2*x+1/4*b^2*e*n^2*x^2+1/4*Pi^2*b^2*e*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*cs
gn(I*c)-1/2*Pi^2*b^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/2*Pi^2*b
^2*d*csgn(I*c*x^n)^5*csgn(I*c)*x+1/4*Pi^2*b^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^
n)^5+1/4*Pi^2*b^2*e*x^2*csgn(I*c*x^n)^5*csgn(I*c)-1/4*Pi^2*b^2*d*csgn(I*c*x
^n)^4*csgn(I*c)^2*x-1/8*Pi^2*b^2*e*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4-1/8*Pi
^2*b^2*e*x^2*csgn(I*c*x^n)^4*csgn(I*c)^2-1/4*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(
I*c*x^n)^4*x+1/2*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^5*x-2*a*b*d*n*x-1/2*I
*ln(c)*Pi*b^2*e*x^2*csgn(I*c*x^n)^3-1/2*I*Pi*a*b*e*x^2*csgn(I*c*x^n)^3+1/4*
I*b^2*n*Pi*e*x^2*csgn(I*c*x^n)^3-I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^3*x-I*Pi*a*
b*d*csgn(I*c*x^n)^3*x+I*b^2*n*Pi*d*csgn(I*c*x^n)^3*x
```

maxima [A] time = 0.59, size = 136, normalized size = 1.35

$$\frac{1}{2}b^2ex^2\log\left(cx^n\right)^2-\frac{1}{2}abenx^2+abex^2\log\left(cx^n\right)+b^2dx\log\left(cx^n\right)^2-2\,abdnx+\frac{1}{2}a^2ex^2+2\,abdx\log\left(cx^n\right)+2\left(n^2x-nx\,\mathrm{lo}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] 1/2*b^2*e*x^2*log(c*x^n)^2 - 1/2*a*b*e*n*x^2 + a*b*e*x^2*log(c*x^n) + b^2*d
*x*log(c*x^n)^2 - 2*a*b*d*n*x + 1/2*a^2*e*x^2 + 2*a*b*d*x*log(c*x^n) + 2*(n
^2*x - n*x*log(c*x^n))*b^2*d + 1/4*(n^2*x^2 - 2*n*x^2*log(c*x^n))*b^2*e + a
^2*d*x
```

mupad [B] time = 3.68, size = 104, normalized size = 1.03

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,\left(2\,a-b\,n\right)\,x^2}{2}+2\,b\,d\,\left(a-b\,n\right)\,x\right)+\ln\left(c\,x^n\right)^2\,\left(\frac{e\,b^2\,x^2}{2}+d\,b^2\,x\right)+\frac{e\,x^2\,\left(2\,a^2-2\,a\,b\,n+b^2\,n^2\right)}{4}+d\,x\,\left(a^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2*(d + e*x),x)
```

```
[Out] log(c*x^n)*((b*e*x^2*(2*a - b*n))/2 + 2*b*d*x*(a - b*n)) + log(c*x^n)^2*((b
^2*e*x^2)/2 + b^2*d*x) + (e*x^2*(2*a^2 + b^2*n^2 - 2*a*b*n))/4 + d*x*(a^2 +
 2*b^2*n^2 - 2*a*b*n)
```

sympy [B] time = 1.10, size = 270, normalized size = 2.67

$$a^2dx+\frac{a^2ex^2}{2}+2abdnx\log(x)-2abdnx+2abdx\log(c)+abenx^2\log(x)-\frac{abenx^2}{2}+abex^2\log(c)+b^2dn^2x\log(x)^2-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))**2,x)
```

```
[Out] a**2*d*x + a**2*e*x**2/2 + 2*a*b*d*n*x*log(x) - 2*a*b*d*n*x + 2*a*b*d*x*log
(c) + a*b*e*n*x**2*log(x) - a*b*e*n*x**2/2 + a*b*e*x**2*log(c) + b**2*d*n**
2*x*log(x)**2 - 2*b**2*d*n**2*x*log(x) + 2*b**2*d*n**2*x + 2*b**2*d*n*x*log
(c)*log(x) - 2*b**2*d*n*x*log(c) + b**2*d*x*log(c)**2 + b**2*e*n**2*x**2*lo
g(x)**2/2 - b**2*e*n**2*x**2*log(x)/2 + b**2*e*n**2*x**2/4 + b**2*e*n*x**2*
log(c)*log(x) - b**2*e*n*x**2*log(c)/2 + b**2*e*x**2*log(c)**2/2
```

3.79 $\int \frac{(d+ex)\left(a+b\log(cx^n)\right)^2}{x}\,dx$

Optimal. Leaf size=70

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^3}{3bn}+ex\left(a+b\log\left(cx^n\right)\right)^2-2abenx-2b^2enx\log\left(cx^n\right)+2b^2en^2x$$

```
[Out] -2*a*b*e*n*x+2*b^2*e*n^2*x-2*b^2*e*n*x*ln(c*x^n)+e*x*(a+b*ln(c*x^n))^2+1/3*
d*(a+b*ln(c*x^n))^3/b/n
```

Rubi [A] time = 0.08, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2346, 2302, 30, 2296, 2295}

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^3}{3bn}+ex\left(a+b\log\left(cx^n\right)\right)^2-2abenx-2b^2enx\log\left(cx^n\right)+2b^2en^2x$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] -2*a*b*e*n*x + 2*b^2*e*n^2*x - 2*b^2*e*n*x*Log[c*x^n] + e*x*(a + b*Log[c*x^
n])^2 + (d*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2346

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[((d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p)/x,
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rubi steps

$$\int \frac{(d+ex)\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx = d\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx + e\int \left(a+b\log\left(cx^n\right)\right)^2\,dx$$

$$= ex\left(a+b\log\left(cx^n\right)\right)^2 + \frac{d\,\mathrm{Subst}\left(\int x^2\,dx, x, a+b\log\left(cx^n\right)\right)}{bn} - (2ben)\int \left(a+\right.$$

$$= -2abenx + ex\left(a+b\log\left(cx^n\right)\right)^2 + \frac{d\left(a+b\log\left(cx^n\right)\right)^3}{3bn} - \left(2b^2en\right)\int \log\left(cx\right.$$

$$= -2abenx + 2b^2en^2x - 2b^2enx\log\left(cx^n\right) + ex\left(a+b\log\left(cx^n\right)\right)^2 + \frac{d\left(a+b\log\right.}{3b}$$

Mathematica [A] time = 0.02, size = 59, normalized size = 0.84

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^3}{3bn} + ex\left(a+b\log\left(cx^n\right)\right)^2 - 2benx\left(a+b\log\left(cx^n\right)-bn\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] e*x*(a + b*Log[c*x^n])^2 + (d*(a + b*Log[c*x^n])^3)/(3*b*n) - 2*b*e*n*x*(a
- b*n + b*Log[c*x^n])
```

fricas [B] time = 0.44, size = 144, normalized size = 2.06

$$\frac{1}{3}b^2dn^2\log(x)^3 + b^2ex\log(c)^2 - 2\left(b^2en - abe\right)x\log(c) + \left(b^2en^2x + b^2dn\log(c) + abdn\right)\log(x)^2 + \left(2b^2en^2 - 2ab\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x,x, algorithm="fricas")
```

```
[Out] 1/3*b^2*d*n^2*log(x)^3 + b^2*e*x*log(c)^2 - 2*(b^2*e*n - a*b*e)*x*log(c) +
(b^2*e*n^2*x + b^2*d*n*log(c) + a*b*d*n)*log(x)^2 + (2*b^2*e*n^2 - 2*a*b*e*
n + a^2*e)*x + (b^2*d*log(c)^2 + a^2*d - 2*(b^2*e*n^2 - a*b*e*n)*x + 2*(b^2
*e*n*x + a*b*d)*log(c))*log(x)
```

giac [B] time = 0.35, size = 169, normalized size = 2.41

$$b^2n^2xe\log(x)^2 + \frac{1}{3}b^2dn^2\log(x)^3 - 2b^2n^2xe\log(x) + 2b^2nxe\log(c)\log(x) + b^2dn\log(c)\log(x)^2 + 2b^2n^2xe - 2b^2nx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x,x, algorithm="giac")
```

```
[Out] b^2*n^2*x*e*log(x)^2 + 1/3*b^2*d*n^2*log(x)^3 - 2*b^2*n^2*x*e*log(x) + 2*b^
2*n*x*e*log(c)*log(x) + b^2*d*n*log(c)*log(x)^2 + 2*b^2*n^2*x*e - 2*b^2*n*x
*e*log(c) + b^2*x*e*log(c)^2 + 2*a*b*n*x*e*log(x) + b^2*d*log(c)^2*log(x) +
 a*b*d*n*log(x)^2 - 2*a*b*n*x*e + 2*a*b*x*e*log(c) + 2*a*b*d*log(c)*log(x)
+ a^2*x*e + a^2*d*log(x)
```

maple [C] time = 0.45, size = 1555, normalized size = 22.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(b*ln(c*x^n)+a)^2/x,x)
```

```
[Out] (b^2*e*x+b^2*d*ln(x))*ln(x^n)^2+(-b^2*d*n*ln(x)^2+I*Pi*ln(x)*b^2*d*csgn(I*x
^n)*csgn(I*c*x^n)^2-I*Pi*ln(x)*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*
Pi*ln(x)*b^2*d*csgn(I*c*x^n)^3+I*Pi*ln(x)*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)+I
*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)-I*Pi*b^2*e*x*csgn(I*c*x^n)^3+I*Pi*b^2*e*x*csgn(I*c*x^n)^2*csg
n(I*c)+2*ln(c)*ln(x)*b^2*d+2*ln(c)*b^2*e*x-2*b^2*n*e*x+2*ln(x)*a*b*d+2*a*b*
e*x)*ln(x^n)+ln(x)*ln(c)^2*b^2*d+ln(c)^2*b^2*e*x+1/3*b^2*d*n^2*ln(x)^3+ln(x
)*a^2*d-1/4*Pi^2*b^2*e*x*csgn(I*c*x^n)^6-1/4*ln(x)*Pi^2*b^2*d*csgn(I*c*x^n)
^6+a^2*e*x+I*ln(x)*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*ln(c)*Pi*b^
2*e*x*csgn(I*c*x^n)^3-I*Pi*a*b*e*x*csgn(I*c*x^n)^3+I*Pi*b^2*e*n*x*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-I*ln(x)*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^3-I*ln(x)*P
i*a*b*d*csgn(I*c*x^n)^3+1/2*I*ln(x)^2*Pi*b^2*d*n*csgn(I*c*x^n)^3+1/2*Pi^2*b
^2*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-I*ln(x)*Pi*a*b*d*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)+1/2*I*ln(x)^2*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-I*Pi*a*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*ln(c)*Pi*b^2*
e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*ln(x)*ln(c)*Pi*b^2*d*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)+2*b^2*e*n^2*x-2*ln(c)*b^2*e*n*x+2*ln(c)*a*b*e*x+2*l
n(x)*ln(c)*a*b*d-ln(x)^2*ln(c)*b^2*d*n-ln(x)^2*a*b*n*d+I*Pi*a*b*e*x*csgn(I*
x^n)*csgn(I*c*x^n)^2-1/4*ln(x)*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csg
n(I*c)^2-ln(x)*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/2*ln(x)*P
i^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+I*Pi*b^2*e*n*x*csgn(I*c*x
^n)^3+I*ln(x)*Pi*a*b*d*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b^2*e*n*x*csgn(I*c*x^
n)^2*csgn(I*c)-1/2*I*ln(x)^2*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*l
n(x)^2*Pi*b^2*d*n*csgn(I*c*x^n)^2*csgn(I*c)+I*ln(c)*Pi*b^2*e*x*csgn(I*x^n)*
csgn(I*c*x^n)^2-I*Pi*b^2*e*n*x*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*Pi^2*b^2*e*x
*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*
c*x^n)^4*csgn(I*c)+1/2*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2
+1/2*ln(x)*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+I*ln(c)*Pi*b^
2*e*x*csgn(I*c*x^n)^2*csgn(I*c)-2*a*b*e*n*x+I*ln(x)*ln(c)*Pi*b^2*d*csgn(I*c
*x^n)^2*csgn(I*c)+I*ln(x)*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*Pi^2*b^2
*e*x*csgn(I*c*x^n)^5*csgn(I*c)-1/4*Pi^2*b^2*e*x*csgn(I*c*x^n)^4*csgn(I*c)^2
-1/4*ln(x)*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/2*ln(x)*Pi^2*b^2*d*cs
gn(I*x^n)*csgn(I*c*x^n)^5+1/2*ln(x)*Pi^2*b^2*d*csgn(I*c*x^n)^5*csgn(I*c)-1/
4*ln(x)*Pi^2*b^2*d*csgn(I*c*x^n)^4*csgn(I*c)^2-1/4*Pi^2*b^2*e*x*csgn(I*x^n)
^2*csgn(I*c*x^n)^4+1/2*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5+I*Pi*a*b*e*
x*csgn(I*c*x^n)^2*csgn(I*c)
```

maxima [A] time = 0.73, size = 101, normalized size = 1.44

$$b^2ex\log\left(cx^n\right)^2 - 2\,abenx + 2\,abex\log\left(cx^n\right) + \frac{b^2d\log\left(cx^n\right)^3}{3\,n} + 2\left(n^2x - nx\log\left(cx^n\right)\right)b^2e + a^2ex + \frac{abd\log\left(cx^n\right)^2}{n} + a^2d\,\mathrm{lo}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x,x, algorithm="maxima")
```

```
[Out] b^2*e*x*log(c*x^n)^2 - 2*a*b*e*n*x + 2*a*b*e*x*log(c*x^n) + 1/3*b^2*d*log(c
*x^n)^3/n + 2*(n^2*x - n*x*log(c*x^n))*b^2*e + a^2*e*x + a*b*d*log(c*x^n)^2
/n + a^2*d*log(x)
```

mupad [B] time = 3.43, size = 85, normalized size = 1.21

$$\ln\left(c\,x^n\right)^2\,\left(b^2\,e\,x + \frac{a\,b\,d}{n}\right) + a^2\,d\,\ln(x) + e\,x\,\left(a^2 - 2\,a\,b\,n + 2\,b^2\,n^2\right) + \frac{b^2\,d\ln\left(c\,x^n\right)^3}{3\,n} + 2\,b\,e\,x\,\ln\left(c\,x^n\right)\,\left(a - b\,n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))^2*(d + e*x))/x,x)
```

```
[Out] log(c*x^n)^2*(b^2*e*x + (a*b*d)/n) + a^2*d*log(x) + e*x*(a^2 + 2*b^2*n^2 -
2*a*b*n) + (b^2*d*log(c*x^n)^3)/(3*n) + 2*b*e*x*log(c*x^n)*(a - b*n)
```

sympy [B] time = 1.05, size = 204, normalized size = 2.91

$$a^2d\log(x)+a^2ex+abdn\log(x)^2+2abd\log(c)\log(x)+2abenx\log(x)-2abenx+2abex\log(c)+\frac{b^2dn^2\log(x)^3}{3}+b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))**2/x,x)
```

```
[Out] a**2*d*log(x) + a**2*e*x + a*b*d*n*log(x)**2 + 2*a*b*d*log(c)*log(x) + 2*a*
b*e*n*x*log(x) - 2*a*b*e*n*x + 2*a*b*e*x*log(c) + b**2*d*n**2*log(x)**3/3 +
 b**2*d*n*log(c)*log(x)**2 + b**2*d*log(c)**2*log(x) + b**2*e*n**2*x*log(x)
**2 - 2*b**2*e*n**2*x*log(x) + 2*b**2*e*n**2*x + 2*b**2*e*n*x*log(c)*log(x)
 - 2*b**2*e*n*x*log(c) + b**2*e*x*log(c)**2
```

3.80 $\int \frac{(d+ex)\left(a+b\log(cx^n)\right)^2}{x^2}\,dx$

Optimal. Leaf size=72

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{2bdn\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{e\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-\frac{2b^2dn^2}{x}$$

```
[Out] -2*b^2*d*n^2/x-2*b*d*n*(a+b*ln(c*x^n))/x-d*(a+b*ln(c*x^n))^2/x+1/3*e*(a+b*l
n(c*x^n))^3/b/n
```

Rubi [A] time = 0.12, antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2353, 2305, 2304, 2302, 30}

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{2bdn\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{e\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-\frac{2b^2dn^2}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)*(a + b*Log[c*x^n])^2)/x^2,x]
```

```
[Out] (-2*b^2*d*n^2)/x - (2*b*d*n*(a + b*Log[c*x^n]))/x - (d*(a + b*Log[c*x^n])^2
)/x + (e*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int \frac{(d+ex)\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\,dx = \int \left(\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{x^2}+\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{x}\right)dx$$
$$= d\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\,dx + e\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx$$
$$= -\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{x} + \frac{e\,\text{Subst}\left(\int x^2\,dx, x, a+b\log\left(cx^n\right)\right)}{bn} + (2bdn)\int \frac{a \cdots}{\cdots}$$
$$= -\frac{2b^2dn^2}{x} - \frac{2bdn\left(a+b\log\left(cx^n\right)\right)}{x} - \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{x} + \frac{e\left(a+b\log\left(cx^n\right)\right. \cdots}{3bn}$$

Mathematica [A] time = 0.04, size = 63, normalized size = 0.88

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{x} - \frac{2bdn\left(a+b\log\left(cx^n\right)+bn\right)}{x} + \frac{e\left(a+b\log\left(cx^n\right)\right)^3}{3bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)*(a + b*Log[c*x^n])^2)/x^2,x]
```

```
[Out] -((d*(a + b*Log[c*x^n])^2)/x) + (e*(a + b*Log[c*x^n])^3)/(3*b*n) - (2*b*d*n
*(a + b*n + b*Log[c*x^n]))/x
```

fricas [B] time = 0.43, size = 149, normalized size = 2.07

$$\frac{b^2en^2x\log(x)^3 - 6\,b^2dn^2 - 3\,b^2d\log(c)^2 - 6\,abdn - 3\,a^2d + 3\left(b^2enx\log(c) - b^2dn^2 + abenx\right)\log(x)^2 - 6\left(b^2d \cdots\right.}{3\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(b^2*e*n^2*x*log(x)^3 - 6*b^2*d*n^2 - 3*b^2*d*log(c)^2 - 6*a*b*d*n - 3*
a^2*d + 3*(b^2*e*n*x*log(c) - b^2*d*n^2 + a*b*e*n*x)*log(x)^2 - 6*(b^2*d*n
+ a*b*d)*log(c) + 3*(b^2*e*x*log(c)^2 - 2*b^2*d*n^2 - 2*a*b*d*n + a^2*e*x -
 2*(b^2*d*n - a*b*e*x)*log(c))*log(x))/x
```

giac [B] time = 0.30, size = 172, normalized size = 2.39

$$\frac{b^2n^2xe\log(x)^3 + 3\,b^2nxe\log(c)\log(x)^2 + 3\,b^2xe\log(c)^2\log(x) - 3\,b^2dn^2\log(x)^2 + 3\,abnxe\log(x)^2 - 6\,b^2dn^2 \cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^2,x, algorithm="giac")
```

```
[Out] 1/3*(b^2*n^2*x*e*log(x)^3 + 3*b^2*n*x*e*log(c)*log(x)^2 + 3*b^2*x*e*log(c)^
2*log(x) - 3*b^2*d*n^2*log(x)^2 + 3*a*b*n*x*e*log(x)^2 - 6*b^2*d*n^2*log(x)
 - 6*b^2*d*n*log(c)*log(x) + 6*a*b*x*e*log(c)*log(x) - 6*b^2*d*n^2 - 6*b^2*
d*n*log(c) - 3*b^2*d*log(c)^2 - 6*a*b*d*n*log(x) + 3*a^2*x*e*log(x) - 6*a*b
*d*n - 6*a*b*d*log(c) - 3*a^2*d)/x
```

maple [C] time = 0.43, size = 1544, normalized size = 21.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(b*ln(c*x^n)+a)^2/x^2,x)
```

```
[Out] -b^2*(-e*x*ln(x)+d)/x*ln(x^n)^2-b*(I*Pi*b*e*x*csgn(I*c)*csgn(I*x^n)*csgn(I*
c*x^n)*ln(x)-I*Pi*b*e*x*csgn(I*c)*csgn(I*c*x^n)^2*ln(x)-I*Pi*b*e*x*csgn(I*x
^n)*csgn(I*c*x^n)^2*ln(x)+I*Pi*b*e*x*csgn(I*c*x^n)^3*ln(x)+b*e*n*x*ln(x)^2-
I*Pi*b*d*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+I*Pi*b*d*csgn(I*c)*csgn(I*c*x^
n)^2+I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*csgn(I*c*x^n)^3-2*b*e*x*
ln(c)*ln(x)-2*a*e*x*ln(x)+2*b*d*n+2*b*d*ln(c)+2*a*d)/x*ln(x^n)+1/12*(3*Pi^2
*b^2*d*csgn(I*c*x^n)^6-24*ln(c)*a*b*d-24*ln(c)*b^2*d*n-12*I*ln(x)*Pi*a*b*e*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+6*I*ln(x)^2*Pi*b^2*e*n*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*x+12*ln(x)*a^2*e*x-12*I*Pi*b^2*d*n*csgn(I*x^n)*csgn(I
*c*x^n)^2-12*I*Pi*b^2*d*n*csgn(I*c*x^n)^2*csgn(I*c)-12*I*ln(c)*Pi*b^2*d*csg
n(I*x^n)*csgn(I*c*x^n)^2-12*I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)-12*a
^2*d-12*ln(c)^2*b^2*d-24*b^2*d*n^2-24*a*b*n*d+12*I*ln(x)*ln(c)*Pi*b^2*e*csg
n(I*c*x^n)^2*csgn(I*c)*x-12*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*
a*b*d*csgn(I*c*x^n)^2*csgn(I*c)+4*b^2*e*n^2*ln(x)^3*x+12*I*Pi*a*b*d*csgn(I*
c*x^n)^3+12*I*Pi*b^2*d*n*csgn(I*c*x^n)^3-3*ln(x)*Pi^2*b^2*e*csgn(I*c*x^n)^6
*x-6*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+6*ln(x)*Pi^2*b^2*e*
csgn(I*c*x^n)^5*csgn(I*c)*x-3*ln(x)*Pi^2*b^2*e*csgn(I*c*x^n)^4*csgn(I*c)^2*
x+6*ln(x)*Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x+3*Pi^2*b^2*d
*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+12*Pi^2*b^2*d*csgn(I*x^n)*csgn(I
*c*x^n)^4*csgn(I*c)-6*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+12
*ln(x)*ln(c)^2*b^2*e*x-12*I*ln(x)*ln(c)*Pi*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*x+3*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^4-6*Pi^2*b^2*d*csgn(I*
x^n)*csgn(I*c*x^n)^5-6*Pi^2*b^2*d*csgn(I*c*x^n)^5*csgn(I*c)+3*Pi^2*b^2*d*cs
gn(I*c*x^n)^4*csgn(I*c)^2-3*ln(x)*Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^4*
x+6*ln(x)*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^5*x-12*I*ln(x)*Pi*a*b*e*csgn
(I*c*x^n)^3*x+6*I*ln(x)^2*Pi*b^2*e*n*csgn(I*c*x^n)^3*x+12*I*ln(c)*Pi*b^2*d*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+12*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)+12*I*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-12*I*ln(x)*l
n(c)*Pi*b^2*e*csgn(I*c*x^n)^3*x-3*ln(x)*Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x
^n)^2*csgn(I*c)^2*x-12*ln(x)*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*
c)*x+6*ln(x)*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*x-6*I*ln(x)
^2*Pi*b^2*e*n*csgn(I*x^n)*csgn(I*c*x^n)^2*x-6*I*ln(x)^2*Pi*b^2*e*n*csgn(I*c
*x^n)^2*csgn(I*c)*x+12*I*ln(x)*Pi*a*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x+12*I*
ln(x)*Pi*a*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x+12*I*ln(x)*ln(c)*Pi*b^2*e*csgn(I
*x^n)*csgn(I*c*x^n)^2*x+24*ln(x)*ln(c)*a*b*e*x-12*ln(x)^2*ln(c)*b^2*e*n*x-1
2*ln(x)^2*a*b*n*e*x+12*I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^3)/x
```

maxima [A] time = 0.83, size = 114, normalized size = 1.58

$$\frac{b^2e\log\left(cx^n\right)^3}{3n} - 2\,b^2d\left(\frac{n^2}{x} + \frac{n\log\left(cx^n\right)}{x}\right) + \frac{abe\log\left(cx^n\right)^2}{n} - \frac{b^2d\log\left(cx^n\right)^2}{x} + a^2e\log(x) - \frac{2\,abdn}{x} - \frac{2\,abd\log\left(cx^n\right)}{x} - \frac{a^2 \cdots}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*b^2*e*log(c*x^n)^3/n - 2*b^2*d*(n^2/x + n*log(c*x^n)/x) + a*b*e*log(c*x
^n)^2/n - b^2*d*log(c*x^n)^2/x + a^2*e*log(x) - 2*a*b*d*n/x - 2*a*b*d*log(c
*x^n)/x - a^2*d/x
```

mupad [B] time = 3.73, size = 138, normalized size = 1.92

$$\ln(x)\,\left(e\,a^2 + 2\,e\,a\,b\,n + 2\,e\,b^2\,n^2\right) - \frac{d\,a^2 + 2\,d\,a\,b\,n + 2\,d\,b^2\,n^2}{x} - \ln\left(c\,x^n\right)^2\,\left(\frac{b^2\,d + b^2\,e\,x}{x} - \frac{b\,e\,\left(a + b\,n\right)}{n}\right) - \frac{\ln\left(c\,x^n\right)\,\left(\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))^2*(d + e*x))/x^2,x)
```

```
[Out] log(x)*(a^2*e + 2*b^2*e*n^2 + 2*a*b*e*n) - (a^2*d + 2*b^2*d*n^2 + 2*a*b*d*n
)/x - log(c*x^n)^2*((b^2*d + b^2*e*x)/x - (b*e*(a + b*n))/n) - (log(c*x^n)*
(2*b*d*(a + b*n) + 2*b*e*x*(a + b*n)))/x + (b^2*e*log(c*x^n)^3)/(3*n)
```

sympy [A] time = 6.63, size = 182, normalized size = 2.53

$$-\frac{a^2d}{x}+a^2e\log(x)-\frac{2abdn}{x}-\frac{2abd\log(cx^n)}{x}-2abe\left(\begin{cases}-\log(c)\log(x) & \text{for } n=0\\ -\frac{\log(cx^n)^2}{2n} & \text{otherwise}\end{cases}\right)-\frac{b^2dn^2\log(x)^2}{x}-\frac{2b^2dn^2\log}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))**2/x**2,x)
```

```
[Out] -a**2*d/x + a**2*e*log(x) - 2*a*b*d*n/x - 2*a*b*d*log(c*x**n)/x - 2*a*b*e*P
iecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True)) - b**2*
d*n**2*log(x)**2/x - 2*b**2*d*n**2*log(x)/x - 2*b**2*d*n**2/x - 2*b**2*d*n*
log(c)*log(x)/x - 2*b**2*d*n*log(c)/x - b**2*d*log(c)**2/x - b**2*e*Piecewi
se((-log(c)**2*log(x), Eq(n, 0)), (-log(c*x**n)**3/(3*n), True))
```

3.81 $\int \frac{(d+ex)\left(a+b\log(cx^n)\right)^2}{x^3}\,dx$

Optimal. Leaf size=103

$$-\frac{bdn\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{2ben\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{b^2dn^2}{4x^2}-\frac{2b^2en^2}{x}$$

```
[Out] -1/4*b^2*d*n^2/x^2-2*b^2*e*n^2/x-1/2*b*d*n*(a+b*ln(c*x^n))/x^2-2*b*e*n*(a+b
*ln(c*x^n))/x-1/2*d*(a+b*ln(c*x^n))^2/x^2-e*(a+b*ln(c*x^n))^2/x
```

Rubi [A] time = 0.13, antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2353, 2305, 2304}

$$-\frac{bdn\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{2ben\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{b^2dn^2}{4x^2}-\frac{2b^2en^2}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)*(a + b*Log[c*x^n])^2)/x^3,x]
```

```
[Out] -(b^2*d*n^2)/(4*x^2) - (2*b^2*e*n^2)/x - (b*d*n*(a + b*Log[c*x^n]))/(2*x^2)
 - (2*b*e*n*(a + b*Log[c*x^n]))/x - (d*(a + b*Log[c*x^n])^2)/(2*x^2) - (e*(
a + b*Log[c*x^n])^2)/x
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int \frac{(d+ex)\left(a+b\log\left(cx^n\right)\right)^2}{x^3}dx = \int \left(\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{x^3}+\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\right)dx$$
$$= d\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^3}dx + e\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2}dx$$
$$= -\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2x^2} - \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{x} + (bdn)\int \frac{a+b\log\left(cx^n\right)}{x^3}dx +$$
$$= -\frac{b^2dn^2}{4x^2} - \frac{2b^2en^2}{x} - \frac{bdn\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{2ben\left(a+b\log\left(cx^n\right)\right)}{x} - \frac{d\left(a+\right.}{}$$

Mathematica [A] time = 0.05, size = 90, normalized size = 0.87

$$-\frac{2a^2(d+2ex)+2b\log\left(cx^n\right)(2a(d+2ex)+bn(d+4ex))+2abn(d+4ex)+2b^2(d+2ex)\log^2\left(cx^n\right)+b^2n^2(d}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)*(a + b*Log[c*x^n])^2)/x^3,x]
```

```
[Out] -1/4*(2*a^2*(d + 2*e*x) + 2*a*b*n*(d + 4*e*x) + b^2*n^2*(d + 8*e*x) + 2*b*(
2*a*(d + 2*e*x) + b*n*(d + 4*e*x))*Log[c*x^n] + 2*b^2*(d + 2*e*x)*Log[c*x^n
]^2)/x^2
```

fricas [A] time = 0.83, size = 179, normalized size = 1.74

$$-\frac{b^2dn^2+2\,abdn+2\,a^2d+2\left(2\,b^2ex+b^2d\right)\log(c)^2+2\left(2\,b^2en^2x+b^2dn^2\right)\log(x)^2+4\left(2\,b^2en^2+2\,aben+a^2e\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^3,x, algorithm="fricas")
```

```
[Out] -1/4*(b^2*d*n^2 + 2*a*b*d*n + 2*a^2*d + 2*(2*b^2*e*x + b^2*d)*log(c)^2 + 2*
(2*b^2*e*n^2*x + b^2*d*n^2)*log(x)^2 + 4*(2*b^2*e*n^2 + 2*a*b*e*n + a^2*e)*
x + 2*(b^2*d*n + 2*a*b*d + 4*(b^2*e*n + a*b*e)*x)*log(c) + 2*(b^2*d*n^2 + 2
*a*b*d*n + 4*(b^2*e*n^2 + a*b*e*n)*x + 2*(2*b^2*e*n*x + b^2*d*n)*log(c))*lo
g(x))/x^2
```

giac [B] time = 0.29, size = 205, normalized size = 1.99

$$-\frac{4\,b^2n^2xe\log(x)^2+8\,b^2n^2xe\log(x)+8\,b^2nxe\log(c)\log(x)+2\,b^2dn^2\log(x)^2+8\,b^2n^2xe+8\,b^2nxe\log(c)+4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^3,x, algorithm="giac")
```

```
[Out] -1/4*(4*b^2*n^2*x*e*log(x)^2 + 8*b^2*n^2*x*e*log(x) + 8*b^2*n*x*e*log(c)*lo
g(x) + 2*b^2*d*n^2*log(x)^2 + 8*b^2*n^2*x*e + 8*b^2*n*x*e*log(c) + 4*b^2*x*
e*log(c)^2 + 2*b^2*d*n^2*log(x) + 8*a*b*n*x*e*log(x) + 4*b^2*d*n*log(c)*log
(x) + b^2*d*n^2 + 8*a*b*n*x*e + 2*b^2*d*n*log(c) + 8*a*b*x*e*log(c) + 2*b^2
*d*log(c)^2 + 4*a*b*d*n*log(x) + 2*a*b*d*n + 4*a^2*x*e + 4*a*b*d*log(c) + 2
*a^2*d)/x^2
```

maple [C] time = 0.24, size = 1483, normalized size = 14.40

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(b*ln(c*x^n)+a)^2/x^3,x)
```

```
[Out] -1/2*b^2*(2*e*x+d)/x^2*ln(x^n)^2-1/2*(2*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x
^n)^2-2*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b^2*e*x*csg
n(I*c*x^n)^3+2*I*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+4*b^2*e*x*ln(c)+4*b^2
*e*n*x+4*a*b*e*x+I*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b^2*d*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b^2*d*csgn(I*c*x^n)^3+I*Pi*b^2*d*csgn(I*c*
x^n)^2*csgn(I*c)+2*ln(c)*b^2*d+b^2*d*n+2*a*b*d)/x^2*ln(x^n)-1/8*(-Pi^2*b^2*
d*csgn(I*c*x^n)^6+8*a*b*d*ln(c)+4*b^2*d*n*ln(c)+8*b^2*e*x*ln(c)^2+4*a^2*d+4
*b^2*d*ln(c)^2-2*Pi^2*b^2*e*x*csgn(I*c*x^n)^6+2*b^2*d*n^2+4*a*b*d*n+8*a^2*e
*x+2*I*Pi*b^2*d*n*csgn(I*c*x^n)^2*csgn(I*c)+4*I*ln(c)*Pi*b^2*d*csgn(I*x^n)*
csgn(I*c*x^n)^2+4*I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*a*b*d*c
sgn(I*x^n)*csgn(I*c*x^n)^2+8*I*ln(c)*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)-4
*I*Pi*a*b*d*csgn(I*c*x^n)^3-2*I*Pi*b^2*d*n*csgn(I*c*x^n)^3-4*I*ln(c)*Pi*b^2
*d*csgn(I*c*x^n)^3-4*I*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4
*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b^2*d*n*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)+2*Pi^2*b^2*d*csgn(I*c)*csgn(I*x^n)^2*csgn(I*c*x^n)^
3-8*I*Pi*a*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*I*ln(c)*Pi*b^2*e*x*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*I*Pi*b^2*e*n*x*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+4*Pi^2*b^2*e*x*csgn(I*c)*csgn(I*x^n)^2*csgn(I*c*x^n)^3+8*I*n*P
i*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+8*I*n*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn
(I*c)+4*I*Pi*a*b*d*csgn(I*c*x^n)^2*csgn(I*c)-8*I*Pi*b^2*e*n*x*csgn(I*c*x^n)
^3+2*I*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)^2+8*I*Pi*a*b*e*x*csgn(I*x^n)*cs
gn(I*c*x^n)^2+8*I*Pi*a*b*e*x*csgn(I*c*x^n)^2*csgn(I*c)-Pi^2*b^2*d*csgn(I*c)
^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2-4*Pi^2*b^2*d*csgn(I*c)*csgn(I*x^n)*csgn(I*
c*x^n)^4+2*Pi^2*b^2*d*csgn(I*c)^2*csgn(I*x^n)*csgn(I*c*x^n)^3+16*b^2*e*n^2*
x+16*b^2*e*n*x*ln(c)+16*a*b*e*x*ln(c)+8*I*ln(c)*Pi*b^2*e*x*csgn(I*x^n)*csgn
(I*c*x^n)^2-Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^4+2*Pi^2*b^2*d*csgn(I*x^
n)*csgn(I*c*x^n)^5+2*Pi^2*b^2*d*csgn(I*c)*csgn(I*c*x^n)^5-8*I*Pi*a*b*e*x*cs
gn(I*c*x^n)^3-8*I*ln(c)*Pi*b^2*e*x*csgn(I*c*x^n)^3-Pi^2*b^2*d*csgn(I*c)^2*c
sgn(I*c*x^n)^4-2*Pi^2*b^2*e*x*csgn(I*c)^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2-8*P
i^2*b^2*e*x*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)^4+4*Pi^2*b^2*e*x*csgn(I*c)^
2*csgn(I*x^n)*csgn(I*c*x^n)^3+16*a*b*e*n*x+4*Pi^2*b^2*e*x*csgn(I*c)*csgn(I*
c*x^n)^5-2*Pi^2*b^2*e*x*csgn(I*c)^2*csgn(I*c*x^n)^4-2*Pi^2*b^2*e*x*csgn(I*x
^n)^2*csgn(I*c*x^n)^4+4*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5)/x^2
```

maxima [A] time = 0.57, size = 150, normalized size = 1.46

$$-2\,b^2e\left(\frac{n^2}{x}+\frac{n\log\left(cx^n\right)}{x}\right)-\frac{1}{4}\,b^2d\left(\frac{n^2}{x^2}+\frac{2\,n\log\left(cx^n\right)}{x^2}\right)-\frac{b^2e\log\left(cx^n\right)^2}{x}-\frac{2\,aben}{x}-\frac{2\,abe\log\left(cx^n\right)}{x}-\frac{b^2d\log\left(cx^n\right)^2}{2\,x^2}-\frac{ab}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^3,x, algorithm="maxima")
```

```
[Out] -2*b^2*e*(n^2/x + n*log(c*x^n)/x) - 1/4*b^2*d*(n^2/x^2 + 2*n*log(c*x^n)/x^2
) - b^2*e*log(c*x^n)^2/x - 2*a*b*e*n/x - 2*a*b*e*log(c*x^n)/x - 1/2*b^2*d*l
og(c*x^n)^2/x^2 - 1/2*a*b*d*n/x^2 - a^2*e/x - a*b*d*log(c*x^n)/x^2 - 1/2*a^
2*d/x^2
```

mupad [B] time = 3.54, size = 109, normalized size = 1.06

$$-\frac{x\,\left(2\,e\,a^2+4\,e\,a\,b\,n+4\,e\,b^2\,n^2\right)+a^2\,d+\frac{b^2\,d\,n^2}{2}+a\,b\,d\,n}{2\,x^2}-\frac{\ln\left(c\,x^n\right)\,\left(\frac{b\,d\,\left(2\,a+b\,n\right)}{2}+2\,b\,e\,x\,\left(a+b\,n\right)\right)}{x^2}-\frac{\ln\left(c\,x^n\right)^2\,\left(\frac{b^2\,d}{2}\right.}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))^2*(d + e*x))/x^3,x)
```

```
[Out] - (x*(2*a^2*e + 4*b^2*e*n^2 + 4*a*b*e*n) + a^2*d + (b^2*d*n^2)/2 + a*b*d*n)
/(2*x^2) - (log(c*x^n)*((b*d*(2*a + b*n))/2 + 2*b*e*x*(a + b*n)))/x^2 - (lo
g(c*x^n)^2*((b^2*d)/2 + b^2*e*x))/x^2
```

sympy [B] time = 1.28, size = 272, normalized size = 2.64

$$-\frac{a^2d}{2x^2}-\frac{a^2e}{x}-\frac{abdn\log(x)}{x^2}-\frac{abdn}{2x^2}-\frac{abd\log(c)}{x^2}-\frac{2aben\log(x)}{x}-\frac{2aben}{x}-\frac{2abe\log(c)}{x}-\frac{b^2dn^2\log(x)^2}{2x^2}-\frac{b^2dn^2\log(}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))**2/x**3,x)
```

```
[Out] -a**2*d/(2*x**2) - a**2*e/x - a*b*d*n*log(x)/x**2 - a*b*d*n/(2*x**2) - a*b*
d*log(c)/x**2 - 2*a*b*e*n*log(x)/x - 2*a*b*e*n/x - 2*a*b*e*log(c)/x - b**2*
d*n**2*log(x)**2/(2*x**2) - b**2*d*n**2*log(x)/(2*x**2) - b**2*d*n**2/(4*x*
*2) - b**2*d*n*log(c)*log(x)/x**2 - b**2*d*n*log(c)/(2*x**2) - b**2*d*log(c
)**2/(2*x**2) - b**2*e*n**2*log(x)**2/x - 2*b**2*e*n**2*log(x)/x - 2*b**2*e
*n**2/x - 2*b**2*e*n*log(c)*log(x)/x - 2*b**2*e*n*log(c)/x - b**2*e*log(c)*
*2/x
```

3.82 $\int \frac{(d+ex)\left(a+b\log(cx^n)\right)^2}{x^4}\,dx$

Optimal. Leaf size=109

$$-\frac{2bdn\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{ben\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{2b^2dn^2}{27x^3}-\frac{b^2en^2}{4x^2}$$

```
[Out] -2/27*b^2*d*n^2/x^3-1/4*b^2*e*n^2/x^2-2/9*b*d*n*(a+b*ln(c*x^n))/x^3-1/2*b*e
*n*(a+b*ln(c*x^n))/x^2-1/3*d*(a+b*ln(c*x^n))^2/x^3-1/2*e*(a+b*ln(c*x^n))^2/
x^2
```

Rubi [A] time = 0.13, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2353, 2305, 2304}

$$-\frac{2bdn\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{ben\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{2b^2dn^2}{27x^3}-\frac{b^2en^2}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)*(a + b*Log[c*x^n])^2)/x^4,x]
```

```
[Out] (-2*b^2*d*n^2)/(27*x^3) - (b^2*e*n^2)/(4*x^2) - (2*b*d*n*(a + b*Log[c*x^n])
)/(9*x^3) - (b*e*n*(a + b*Log[c*x^n]))/(2*x^2) - (d*(a + b*Log[c*x^n])^2)/(
3*x^3) - (e*(a + b*Log[c*x^n])^2)/(2*x^2)
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int \frac{(d+ex)\left(a+b\log\left(cx^n\right)\right)^2}{x^4}\,dx = \int \left(\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{x^4} + \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{x^3}\right)dx$$
$$= d\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^4}\,dx + e\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^3}\,dx$$
$$= -\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3x^3} - \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2x^2} + \frac{1}{3}(2bdn)\int \frac{a+b\log\left(cx^n\right)}{x^4}\,d$$
$$= -\frac{2b^2dn^2}{27x^3} - \frac{b^2en^2}{4x^2} - \frac{2bdn\left(a+b\log\left(cx^n\right)\right)}{9x^3} - \frac{ben\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{d\left(a+\right.}{}$$

Mathematica [A] time = 0.06, size = 82, normalized size = 0.75

$$-\frac{36d\left(a+b\log\left(cx^n\right)\right)^2 + 8bdn\left(3a+3b\log\left(cx^n\right)+bn\right) + 54ex\left(a+b\log\left(cx^n\right)\right)^2 + 27benx\left(2a+2b\log\left(cx^n\right)\right.}{108x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)*(a + b*Log[c*x^n])^2)/x^4,x]
```

```
[Out] -1/108*(36*d*(a + b*Log[c*x^n])^2 + 54*e*x*(a + b*Log[c*x^n])^2 + 27*b*e*n*
x*(2*a + b*n + 2*b*Log[c*x^n]) + 8*b*d*n*(3*a + b*n + 3*b*Log[c*x^n]))/x^3
```

fricas [A] time = 0.56, size = 187, normalized size = 1.72

$$-\frac{8\,b^2dn^2 + 24\,abdn + 36\,a^2d + 18\left(3\,b^2ex + 2\,b^2d\right)\log(c)^2 + 18\left(3\,b^2en^2x + 2\,b^2dn^2\right)\log(x)^2 + 27\left(b^2en^2 + 2\,a\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^4,x, algorithm="fricas")
```

```
[Out] -1/108*(8*b^2*d*n^2 + 24*a*b*d*n + 36*a^2*d + 18*(3*b^2*e*x + 2*b^2*d)*log(
c)^2 + 18*(3*b^2*e*n^2*x + 2*b^2*d*n^2)*log(x)^2 + 27*(b^2*e*n^2 + 2*a*b*e*
n + 2*a^2*e)*x + 6*(4*b^2*d*n + 12*a*b*d + 9*(b^2*e*n + 2*a*b*e)*x)*log(c)
+ 6*(4*b^2*d*n^2 + 12*a*b*d*n + 9*(b^2*e*n^2 + 2*a*b*e*n)*x + 6*(3*b^2*e*n*
x + 2*b^2*d*n)*log(c))*log(x))/x^3
```

giac [B] time = 0.34, size = 206, normalized size = 1.89

$$-\frac{54\,b^2n^2xe\log(x)^2 + 54\,b^2n^2xe\log(x) + 108\,b^2nxe\log(c)\log(x) + 36\,b^2dn^2\log(x)^2 + 27\,b^2n^2xe + 54\,b^2nxe\,\mathrm{lo}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^4,x, algorithm="giac")
```

```
[Out] -1/108*(54*b^2*n^2*x*e*log(x)^2 + 54*b^2*n^2*x*e*log(x) + 108*b^2*n*x*e*log
(c)*log(x) + 36*b^2*d*n^2*log(x)^2 + 27*b^2*n^2*x*e + 54*b^2*n*x*e*log(c) +
 54*b^2*x*e*log(c)^2 + 24*b^2*d*n^2*log(x) + 108*a*b*n*x*e*log(x) + 72*b^2*
d*n*log(c)*log(x) + 8*b^2*d*n^2 + 54*a*b*n*x*e + 24*b^2*d*n*log(c) + 108*a*
b*x*e*log(c) + 36*b^2*d*log(c)^2 + 72*a*b*d*n*log(x) + 24*a*b*d*n + 54*a^2*
x*e + 72*a*b*d*log(c) + 36*a^2*d)/x^3
```

maple [C] time = 0.25, size = 1486, normalized size = 13.63

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(b*ln(c*x^n)+a)^2/x^4,x)
```

```
[Out] -1/6*b^2*(3*e*x+2*d)/x^3*ln(x^n)^2-1/18*(9*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*
c*x^n)^2-9*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi*b^2*e*x*
csgn(I*c*x^n)^3+9*I*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+18*b^2*e*x*ln(c)+9
*b^2*e*n*x+18*a*b*e*x+6*I*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2-6*I*Pi*b^2*d
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-6*I*Pi*b^2*d*csgn(I*c*x^n)^3+6*I*Pi*b^
2*d*csgn(I*c*x^n)^2*csgn(I*c)+12*b^2*d*ln(c)+4*b^2*d*n+12*a*b*d)/x^3*ln(x^n
)-1/216*(-18*Pi^2*b^2*d*csgn(I*c*x^n)^6+144*a*b*d*ln(c)+48*b^2*d*n*ln(c)+10
8*b^2*e*x*ln(c)^2+72*a^2*d+72*b^2*d*ln(c)^2-27*Pi^2*b^2*e*x*csgn(I*c*x^n)^6
+16*b^2*d*n^2+48*a*b*d*n+108*a^2*e*x+36*Pi^2*b^2*d*csgn(I*c)*csgn(I*x^n)^2*
csgn(I*c*x^n)^3+54*Pi^2*b^2*e*x*csgn(I*c)*csgn(I*x^n)^2*csgn(I*c*x^n)^3-108
*I*ln(c)*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-54*I*Pi*b^2*e*n*x*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-108*I*Pi*a*b*e*x*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)-18*Pi^2*b^2*d*csgn(I*c)^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2-72*Pi^
2*b^2*d*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)^4+36*Pi^2*b^2*d*csgn(I*c)^2*csg
n(I*x^n)*csgn(I*c*x^n)^3+54*b^2*e*n^2*x+108*b^2*e*n*x*ln(c)+216*a*b*e*x*ln(
c)+54*I*n*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+54*I*n*Pi*b^2*e*x*csgn(I*c
*x^n)^2*csgn(I*c)+108*I*Pi*a*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+108*I*Pi*a*b
*e*x*csgn(I*c*x^n)^2*csgn(I*c)+108*I*ln(c)*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(
I*c)-72*I*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-72*I*Pi*a*b*d*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-24*I*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+108*I*ln(c)*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-18*Pi^2*b^2
*d*csgn(I*x^n)^2*csgn(I*c*x^n)^4+36*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^5+
36*Pi^2*b^2*d*csgn(I*c)*csgn(I*c*x^n)^5-18*Pi^2*b^2*d*csgn(I*c)^2*csgn(I*c*
x^n)^4-108*I*ln(c)*Pi*b^2*e*x*csgn(I*c*x^n)^3+24*I*Pi*b^2*d*n*csgn(I*x^n)*c
sgn(I*c*x^n)^2+24*I*Pi*b^2*d*n*csgn(I*c*x^n)^2*csgn(I*c)-54*I*Pi*b^2*e*n*x*
csgn(I*c*x^n)^3-27*Pi^2*b^2*e*x*csgn(I*c)^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2-1
08*Pi^2*b^2*e*x*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)^4+54*Pi^2*b^2*e*x*csgn(
I*c)^2*csgn(I*x^n)*csgn(I*c*x^n)^3+108*a*b*e*n*x+54*Pi^2*b^2*e*x*csgn(I*c)*
csgn(I*c*x^n)^5-27*Pi^2*b^2*e*x*csgn(I*c)^2*csgn(I*c*x^n)^4-27*Pi^2*b^2*e*x
*csgn(I*x^n)^2*csgn(I*c*x^n)^4+54*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5-
72*I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^3-72*I*Pi*a*b*d*csgn(I*c*x^n)^3-24*I*Pi*b
^2*d*n*csgn(I*c*x^n)^3+72*I*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2+72*I
*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)+72*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*
c*x^n)^2+72*I*Pi*a*b*d*csgn(I*c*x^n)^2*csgn(I*c)-108*I*Pi*a*b*e*x*csgn(I*c*
x^n)^3)/x^3
```

maxima [A] time = 0.61, size = 151, normalized size = 1.39

$$-\frac{1}{4}\,b^2e\left(\frac{n^2}{x^2}+\frac{2\,n\log\left(cx^n\right)}{x^2}\right)-\frac{2}{27}\,b^2d\left(\frac{n^2}{x^3}+\frac{3\,n\log\left(cx^n\right)}{x^3}\right)-\frac{b^2e\log\left(cx^n\right)^2}{2\,x^2}-\frac{aben}{2\,x^2}-\frac{abe\log\left(cx^n\right)}{x^2}-\frac{b^2d\log\left(cx^n\right)^2}{3\,x^3}-\frac{2}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^4,x, algorithm="maxima")
```

```
[Out] -1/4*b^2*e*(n^2/x^2 + 2*n*log(c*x^n)/x^2) - 2/27*b^2*d*(n^2/x^3 + 3*n*log(c
*x^n)/x^3) - 1/2*b^2*e*log(c*x^n)^2/x^2 - 1/2*a*b*e*n/x^2 - a*b*e*log(c*x^n
)/x^2 - 1/3*b^2*d*log(c*x^n)^2/x^3 - 2/9*a*b*d*n/x^3 - 1/2*a^2*e/x^2 - 2/3*
a*b*d*log(c*x^n)/x^3 - 1/3*a^2*d/x^3
```

mupad [B] time = 3.79, size = 114, normalized size = 1.05

$$-\frac{x\left(9\,e\,a^2+9\,e\,a\,b\,n+\frac{9\,e\,b^2\,n^2}{2}\right)+6\,a^2\,d+\frac{4\,b^2\,d\,n^2}{3}+4\,a\,b\,d\,n}{18\,x^3}-\frac{\ln\left(c\,x^n\right)\left(\frac{2\,b\,d\,\left(3\,a+b\,n\right)}{3}+\frac{3\,b\,e\,x\,\left(2\,a+b\,n\right)}{2}\right)}{3\,x^3}-\frac{\ln\left(c\,x^n\right)^2\,\left(\frac{b^2}{3}\right.}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))^2*(d + e*x))/x^4,x)
```

```
[Out] - (x*(9*a^2*e + (9*b^2*e*n^2)/2 + 9*a*b*e*n) + 6*a^2*d + (4*b^2*d*n^2)/3 +
4*a*b*d*n)/(18*x^3) - (log(c*x^n)*((2*b*d*(3*a + b*n))/3 + (3*b*e*x*(2*a +
b*n))/2))/(3*x^3) - (log(c*x^n)^2*((b^2*d)/3 + (b^2*e*x)/2))/x^3
```

sympy [B] time = 2.03, size = 306, normalized size = 2.81

$$-\frac{a^2d}{3x^3}-\frac{a^2e}{2x^2}-\frac{2abdn\log(x)}{3x^3}-\frac{2abdn}{9x^3}-\frac{2abd\log(c)}{3x^3}-\frac{aben\log(x)}{x^2}-\frac{aben}{2x^2}-\frac{abe\log(c)}{x^2}-\frac{b^2dn^2\log(x)^2}{3x^3}-\frac{2b^2dn^2\log}{9x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))**2/x**4,x)
```

```
[Out] -a**2*d/(3*x**3) - a**2*e/(2*x**2) - 2*a*b*d*n*log(x)/(3*x**3) - 2*a*b*d*n/
(9*x**3) - 2*a*b*d*log(c)/(3*x**3) - a*b*e*n*log(x)/x**2 - a*b*e*n/(2*x**2)
 - a*b*e*log(c)/x**2 - b**2*d*n**2*log(x)**2/(3*x**3) - 2*b**2*d*n**2*log(x
)/(9*x**3) - 2*b**2*d*n**2/(27*x**3) - 2*b**2*d*n*log(c)*log(x)/(3*x**3) -
2*b**2*d*n*log(c)/(9*x**3) - b**2*d*log(c)**2/(3*x**3) - b**2*e*n**2*log(x)
**2/(2*x**2) - b**2*e*n**2*log(x)/(2*x**2) - b**2*e*n**2/(4*x**2) - b**2*e*
n*log(c)*log(x)/x**2 - b**2*e*n*log(c)/(2*x**2) - b**2*e*log(c)**2/(2*x**2)
```

3.83 $\int \frac{(d+ex)\left(a+b\log(cx^n)\right)^2}{x^5}\,dx$

Optimal. Leaf size=109

$$-\frac{bdn\left(a+b\log\left(cx^n\right)\right)}{8x^4}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{4x^4}-\frac{2ben\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{b^2dn^2}{32x^4}-\frac{2b^2en^2}{27x^3}$$

```
[Out] -1/32*b^2*d*n^2/x^4-2/27*b^2*e*n^2/x^3-1/8*b*d*n*(a+b*ln(c*x^n))/x^4-2/9*b*
e*n*(a+b*ln(c*x^n))/x^3-1/4*d*(a+b*ln(c*x^n))^2/x^4-1/3*e*(a+b*ln(c*x^n))^2
/x^3
```

Rubi [A] time = 0.14, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2353, 2305, 2304}

$$-\frac{bdn\left(a+b\log\left(cx^n\right)\right)}{8x^4}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{4x^4}-\frac{2ben\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{b^2dn^2}{32x^4}-\frac{2b^2en^2}{27x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)*(a + b*Log[c*x^n])^2)/x^5,x]
```

```
[Out] -(b^2*d*n^2)/(32*x^4) - (2*b^2*e*n^2)/(27*x^3) - (b*d*n*(a + b*Log[c*x^n]))
/(8*x^4) - (2*b*e*n*(a + b*Log[c*x^n]))/(9*x^3) - (d*(a + b*Log[c*x^n])^2)/
(4*x^4) - (e*(a + b*Log[c*x^n])^2)/(3*x^3)
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int \frac{(d+ex)\left(a+b\log(cx^n)\right)^2}{x^5}\,dx = \int \left(\frac{d\left(a+b\log(cx^n)\right)^2}{x^5} + \frac{e\left(a+b\log(cx^n)\right)^2}{x^4}\right)dx$$

$$= d\int \frac{\left(a+b\log(cx^n)\right)^2}{x^5}\,dx + e\int \frac{\left(a+b\log(cx^n)\right)^2}{x^4}\,dx$$

$$= -\frac{d\left(a+b\log(cx^n)\right)^2}{4x^4} - \frac{e\left(a+b\log(cx^n)\right)^2}{3x^3} + \frac{1}{2}(bdn)\int \frac{a+b\log(cx^n)}{x^5}\,dx$$

$$= -\frac{b^2dn^2}{32x^4} - \frac{2b^2en^2}{27x^3} - \frac{bdn\left(a+b\log(cx^n)\right)}{8x^4} - \frac{2ben\left(a+b\log(cx^n)\right)}{9x^3} - \frac{d\left(a+\right.}{}$$

Mathematica [A] time = 0.06, size = 82, normalized size = 0.75

$$-\frac{216d\left(a+b\log(cx^n)\right)^2 + 27bdn\left(4a+4b\log(cx^n)+bn\right) + 288ex\left(a+b\log(cx^n)\right)^2 + 64benx\left(3a+3b\log(c\right.}{864x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)*(a + b*Log[c*x^n])^2)/x^5,x]
```

```
[Out] -1/864*(216*d*(a + b*Log[c*x^n])^2 + 288*e*x*(a + b*Log[c*x^n])^2 + 64*b*e*
n*x*(3*a + b*n + 3*b*Log[c*x^n]) + 27*b*d*n*(4*a + b*n + 4*b*Log[c*x^n]))/x
^4
```

fricas [A] time = 0.67, size = 188, normalized size = 1.72

$$-\frac{27\,b^2dn^2 + 108\,abdn + 216\,a^2d + 72\left(4\,b^2ex + 3\,b^2d\right)\log(c)^2 + 72\left(4\,b^2en^2x + 3\,b^2dn^2\right)\log(x)^2 + 32\left(2\,b^2en^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^5,x, algorithm="fricas")
```

```
[Out] -1/864*(27*b^2*d*n^2 + 108*a*b*d*n + 216*a^2*d + 72*(4*b^2*e*x + 3*b^2*d)*l
og(c)^2 + 72*(4*b^2*e*n^2*x + 3*b^2*d*n^2)*log(x)^2 + 32*(2*b^2*e*n^2 + 6*a
*b*e*n + 9*a^2*e)*x + 12*(9*b^2*d*n + 36*a*b*d + 16*(b^2*e*n + 3*a*b*e)*x)*
log(c) + 12*(9*b^2*d*n^2 + 36*a*b*d*n + 16*(b^2*e*n^2 + 3*a*b*e*n)*x + 12*(
4*b^2*e*n*x + 3*b^2*d*n)*log(c))*log(x))/x^4
```

giac [B] time = 0.31, size = 206, normalized size = 1.89

$$-\frac{288\,b^2n^2xe\log(x)^2 + 192\,b^2n^2xe\log(x) + 576\,b^2nxe\log(c)\log(x) + 216\,b^2dn^2\log(x)^2 + 64\,b^2n^2xe + 192\,b^2n}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^5,x, algorithm="giac")
```

```
[Out] -1/864*(288*b^2*n^2*x*e*log(x)^2 + 192*b^2*n^2*x*e*log(x) + 576*b^2*n*x*e*l
og(c)*log(x) + 216*b^2*d*n^2*log(x)^2 + 64*b^2*n^2*x*e + 192*b^2*n*x*e*log(
c) + 288*b^2*x*e*log(c)^2 + 108*b^2*d*n^2*log(x) + 576*a*b*n*x*e*log(x) + 4
32*b^2*d*n*log(c)*log(x) + 27*b^2*d*n^2 + 192*a*b*n*x*e + 108*b^2*d*n*log(c
) + 576*a*b*x*e*log(c) + 216*b^2*d*log(c)^2 + 432*a*b*d*n*log(x) + 108*a*b*
d*n + 288*a^2*x*e + 432*a*b*d*log(c) + 216*a^2*d)/x^4
```

maple [C] time = 0.26, size = 1486, normalized size = 13.63

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(b*ln(c*x^n)+a)^2/x^5,x)
```

```
[Out] -1/12*b^2*(4*e*x+3*d)/x^4*ln(x^n)^2-1/72*(24*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(
I*c*x^n)^2-24*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-24*I*Pi*b^2*
e*x*csgn(I*c*x^n)^3+24*I*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+48*b^2*e*x*ln
(c)+16*b^2*e*n*x+48*a*b*e*x+18*I*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2-18*I*
Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*I*Pi*b^2*d*csgn(I*c*x^n)^3+
18*I*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)+36*b^2*d*ln(c)+9*b^2*d*n+36*a*b*d)/
x^4*ln(x^n)-1/864*(-54*Pi^2*b^2*d*csgn(I*c*x^n)^6+432*a*b*d*ln(c)+108*b^2*d
*n*ln(c)+288*b^2*e*x*ln(c)^2+216*a^2*d+216*b^2*d*ln(c)^2-72*Pi^2*b^2*e*x*cs
gn(I*c*x^n)^6+27*b^2*d*n^2+108*a*b*d*n+288*a^2*e*x-96*I*Pi*b^2*e*n*x*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)+108*Pi^2*b^2*d*csgn(I*c)*csgn(I*x^n)^2*csgn(I
*c*x^n)^3+54*I*Pi*b^2*d*n*csgn(I*c*x^n)^2*csgn(I*c)+144*Pi^2*b^2*e*x*csgn(I
*c)*csgn(I*x^n)^2*csgn(I*c*x^n)^3-288*I*Pi*a*b*e*x*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)-288*I*ln(c)*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+216*
I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+216*I*Pi*a*b*d*csgn(I*c*x^n)^2*csgn(
I*c)-96*I*Pi*b^2*e*n*x*csgn(I*c*x^n)^3-54*Pi^2*b^2*d*csgn(I*c)^2*csgn(I*x^n
)^2*csgn(I*c*x^n)^2-216*Pi^2*b^2*d*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)^4+10
8*Pi^2*b^2*d*csgn(I*c)^2*csgn(I*x^n)*csgn(I*c*x^n)^3+64*b^2*e*n^2*x+192*b^2
*e*n*x*ln(c)+576*a*b*e*x*ln(c)+96*I*n*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^
2+96*I*n*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+288*I*Pi*a*b*e*x*csgn(I*x^n)*
csgn(I*c*x^n)^2+288*I*Pi*a*b*e*x*csgn(I*c*x^n)^2*csgn(I*c)+288*I*ln(c)*Pi*b
^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)-216*I*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)-216*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-54*I*Pi*b
^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+288*I*ln(c)*Pi*b^2*e*x*csgn(I*x^
n)*csgn(I*c*x^n)^2-54*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^4+108*Pi^2*b^2
*d*csgn(I*x^n)*csgn(I*c*x^n)^5+108*Pi^2*b^2*d*csgn(I*c)*csgn(I*c*x^n)^5-54*
Pi^2*b^2*d*csgn(I*c)^2*csgn(I*c*x^n)^4-216*I*Pi*a*b*d*csgn(I*c*x^n)^3-54*I*
Pi*b^2*d*n*csgn(I*c*x^n)^3-72*Pi^2*b^2*e*x*csgn(I*c)^2*csgn(I*x^n)^2*csgn(I
*c*x^n)^2-288*Pi^2*b^2*e*x*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)^4+144*Pi^2*b
^2*e*x*csgn(I*c)^2*csgn(I*x^n)*csgn(I*c*x^n)^3-288*I*Pi*a*b*e*x*csgn(I*c*x^
n)^3-288*I*ln(c)*Pi*b^2*e*x*csgn(I*c*x^n)^3+54*I*Pi*b^2*d*n*csgn(I*x^n)*csg
n(I*c*x^n)^2+192*a*b*e*n*x+144*Pi^2*b^2*e*x*csgn(I*c)*csgn(I*c*x^n)^5-72*Pi
^2*b^2*e*x*csgn(I*c)^2*csgn(I*c*x^n)^4-72*Pi^2*b^2*e*x*csgn(I*x^n)^2*csgn(I
*c*x^n)^4+144*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5-216*I*ln(c)*Pi*b^2*d
*csgn(I*c*x^n)^3+216*I*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2+216*I*ln(
c)*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*c))/x^4
```

maxima [A] time = 0.74, size = 151, normalized size = 1.39

$$-\frac{2}{27}b^2e\left(\frac{n^2}{x^3}+\frac{3n\log(cx^n)}{x^3}\right)-\frac{1}{32}b^2d\left(\frac{n^2}{x^4}+\frac{4n\log(cx^n)}{x^4}\right)-\frac{b^2e\log(cx^n)^2}{3x^3}-\frac{2aben}{9x^3}-\frac{2abe\log(cx^n)}{3x^3}-\frac{b^2d\log(cx^n)^2}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^5,x, algorithm="maxima")
```

```
[Out] -2/27*b^2*e*(n^2/x^3 + 3*n*log(c*x^n)/x^3) - 1/32*b^2*d*(n^2/x^4 + 4*n*log(
c*x^n)/x^4) - 1/3*b^2*e*log(c*x^n)^2/x^3 - 2/9*a*b*e*n/x^3 - 2/3*a*b*e*log(
c*x^n)/x^3 - 1/4*b^2*d*log(c*x^n)^2/x^4 - 1/8*a*b*d*n/x^4 - 1/3*a^2*e/x^3 -
 1/2*a*b*d*log(c*x^n)/x^4 - 1/4*a^2*d/x^4
```

mupad [B] time = 3.51, size = 114, normalized size = 1.05

$$-\frac{x\left(24ea^2+16eabn+\frac{16eb^2n^2}{3}\right)+18a^2d+\frac{9b^2dn^2}{4}+9abdn}{72x^4}-\frac{\ln(cx^n)\left(\frac{3bd(4a+bn)}{4}+\frac{4bex(3a+bn)}{3}\right)}{6x^4}-\frac{\ln(cx^n)^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))^2*(d + e*x))/x^5,x)
```

```
[Out] - (x*(24*a^2*e + (16*b^2*e*n^2)/3 + 16*a*b*e*n) + 18*a^2*d + (9*b^2*d*n^2)/
4 + 9*a*b*d*n)/(72*x^4) - (log(c*x^n)*((3*b*d*(4*a + b*n))/4 + (4*b*e*x*(3*
a + b*n))/3))/(6*x^4) - (log(c*x^n)^2*((b^2*d)/4 + (b^2*e*x)/3))/x^4
```

sympy [B] time = 3.07, size = 311, normalized size = 2.85

$$-\frac{a^2d}{4x^4}-\frac{a^2e}{3x^3}-\frac{abdn\log(x)}{2x^4}-\frac{abdn}{8x^4}-\frac{abd\log(c)}{2x^4}-\frac{2aben\log(x)}{3x^3}-\frac{2aben}{9x^3}-\frac{2abe\log(c)}{3x^3}-\frac{b^2dn^2\log(x)^2}{4x^4}-\frac{b^2dn^2\log(}{8x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))**2/x**5,x)
```

```
[Out] -a**2*d/(4*x**4) - a**2*e/(3*x**3) - a*b*d*n*log(x)/(2*x**4) - a*b*d*n/(8*x
**4) - a*b*d*log(c)/(2*x**4) - 2*a*b*e*n*log(x)/(3*x**3) - 2*a*b*e*n/(9*x**
3) - 2*a*b*e*log(c)/(3*x**3) - b**2*d*n**2*log(x)**2/(4*x**4) - b**2*d*n**2
*log(x)/(8*x**4) - b**2*d*n**2/(32*x**4) - b**2*d*n*log(c)*log(x)/(2*x**4)
- b**2*d*n*log(c)/(8*x**4) - b**2*d*log(c)**2/(4*x**4) - b**2*e*n**2*log(x)
**2/(3*x**3) - 2*b**2*e*n**2*log(x)/(9*x**3) - 2*b**2*e*n**2/(27*x**3) - 2*
b**2*e*n*log(c)*log(x)/(3*x**3) - 2*b**2*e*n*log(c)/(9*x**3) - b**2*e*log(c
)**2/(3*x**3)
```

3.84 $\int x^2(d+ex)^2\left(a+b\log\left(cx^n\right)\right)^2\,dx$

Optimal. Leaf size=178

$$\frac{1}{3}d^2x^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{2}{9}bd^2nx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}dex^4\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{4}bdenx^4\left(a+b\log\left(cx^n\right)\right)+\frac{1}{5}e^2x^5\left(\right.$$

```
[Out] 2/27*b^2*d^2*n^2*x^3+1/16*b^2*d*e*n^2*x^4+2/125*b^2*e^2*n^2*x^5-2/9*b*d^2*n
*x^3*(a+b*ln(c*x^n))-1/4*b*d*e*n*x^4*(a+b*ln(c*x^n))-2/25*b*e^2*n*x^5*(a+b*
ln(c*x^n))+1/3*d^2*x^3*(a+b*ln(c*x^n))^2+1/2*d*e*x^4*(a+b*ln(c*x^n))^2+1/5*
e^2*x^5*(a+b*ln(c*x^n))^2
```

Rubi [A] time = 0.22, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2353, 2305, 2304}

$$\frac{1}{3}d^2x^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{2}{9}bd^2nx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}dex^4\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{4}bdenx^4\left(a+b\log\left(cx^n\right)\right)+\frac{1}{5}e^2x^5\left(\right.$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x)^2*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b^2*d^2*n^2*x^3)/27 + (b^2*d*e*n^2*x^4)/16 + (2*b^2*e^2*n^2*x^5)/125 - (
2*b*d^2*n*x^3*(a + b*Log[c*x^n]))/9 - (b*d*e*n*x^4*(a + b*Log[c*x^n]))/4 -
(2*b*e^2*n*x^5*(a + b*Log[c*x^n]))/25 + (d^2*x^3*(a + b*Log[c*x^n])^2)/3 +
(d*e*x^4*(a + b*Log[c*x^n])^2)/2 + (e^2*x^5*(a + b*Log[c*x^n])^2)/5
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\begin{aligned}\int x^2(d+ex)^2\left(a+b\log\left(cx^n\right)\right)^2\,dx &= \int\left(d^2x^2\left(a+b\log\left(cx^n\right)\right)^2+2dex^3\left(a+b\log\left(cx^n\right)\right)^2+e^2x^4\left(a+b\log\left(cx^n\right.\right.\right.\\ &= d^2\int x^2\left(a+b\log\left(cx^n\right)\right)^2\,dx+(2de)\int x^3\left(a+b\log\left(cx^n\right)\right)^2\,dx+e^2\int x^4\\ &= \frac{1}{3}d^2x^3\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{2}dex^4\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{5}e^2x^5\left(a+b\log\left(cx^n\right.\right.\\ &= \frac{2}{27}b^2d^2n^2x^3+\frac{1}{16}b^2den^2x^4+\frac{2}{125}b^2e^2n^2x^5-\frac{2}{9}bd^2nx^3\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}\end{aligned}$$

Mathematica [A] time = 0.10, size = 149, normalized size = 0.84

$$\frac{1}{3}d^2x^3\left(a+b\log\left(cx^n\right)\right)^2+\frac{2}{27}bd^2nx^3\left(-3a-3b\log\left(cx^n\right)+bn\right)+\frac{1}{2}dex^4\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{16}bdenx^4\left(-4a-4b\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x)^2*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b*e^2*n*x^5*(-5*a + b*n - 5*b*Log[c*x^n]))/125 + (b*d*e*n*x^4*(-4*a + b*
n - 4*b*Log[c*x^n]))/16 + (2*b*d^2*n*x^3*(-3*a + b*n - 3*b*Log[c*x^n]))/27
+ (d^2*x^3*(a + b*Log[c*x^n])^2)/3 + (d*e*x^4*(a + b*Log[c*x^n])^2)/2 + (e^
2*x^5*(a + b*Log[c*x^n])^2)/5
```

fricas [B] time = 0.43, size = 364, normalized size = 2.04

$$\frac{1}{125}\left(2\,b^2e^2n^2-10\,abe^2n+25\,a^2e^2\right)x^5+\frac{1}{16}\left(b^2den^2-4\,abden+8\,a^2de\right)x^4+\frac{1}{27}\left(2\,b^2d^2n^2-6\,abd^2n+9\,a^2d^2\right)x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x+d)^2*(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] 1/125*(2*b^2*e^2*n^2 - 10*a*b*e^2*n + 25*a^2*e^2)*x^5 + 1/16*(b^2*d*e*n^2 -
 4*a*b*d*e*n + 8*a^2*d*e)*x^4 + 1/27*(2*b^2*d^2*n^2 - 6*a*b*d^2*n + 9*a^2*d
^2)*x^3 + 1/30*(6*b^2*e^2*x^5 + 15*b^2*d*e*x^4 + 10*b^2*d^2*x^3)*log(c)^2 +
 1/30*(6*b^2*e^2*n^2*x^5 + 15*b^2*d*e*n^2*x^4 + 10*b^2*d^2*n^2*x^3)*log(x)^
2 - 1/900*(72*(b^2*e^2*n - 5*a*b*e^2)*x^5 + 225*(b^2*d*e*n - 4*a*b*d*e)*x^4
 + 200*(b^2*d^2*n - 3*a*b*d^2)*x^3)*log(c) - 1/900*(72*(b^2*e^2*n^2 - 5*a*b
*e^2*n)*x^5 + 225*(b^2*d*e*n^2 - 4*a*b*d*e*n)*x^4 + 200*(b^2*d^2*n^2 - 3*a*
b*d^2*n)*x^3 - 60*(6*b^2*e^2*n*x^5 + 15*b^2*d*e*n*x^4 + 10*b^2*d^2*n*x^3)*l
og(c))*log(x)
```

giac [B] time = 0.38, size = 408, normalized size = 2.29

$$\frac{1}{5}\,b^2n^2x^5e^2\log(x)^2+\frac{1}{2}\,b^2dn^2x^4e\log(x)^2-\frac{2}{25}\,b^2n^2x^5e^2\log(x)-\frac{1}{4}\,b^2dn^2x^4e\log(x)+\frac{2}{5}\,b^2nx^5e^2\log(c)\log(x)+b^2d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x+d)^2*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] 1/5*b^2*n^2*x^5*e^2*log(x)^2 + 1/2*b^2*d*n^2*x^4*e*log(x)^2 - 2/25*b^2*n^2*
x^5*e^2*log(x) - 1/4*b^2*d*n^2*x^4*e*log(x) + 2/5*b^2*n*x^5*e^2*log(c)*log(
x) + b^2*d*n*x^4*e*log(c)*log(x) + 1/3*b^2*d^2*n^2*x^3*log(x)^2 + 2/125*b^2
*n^2*x^5*e^2 + 1/16*b^2*d*n^2*x^4*e - 2/25*b^2*n*x^5*e^2*log(c) - 1/4*b^2*d
*n*x^4*e*log(c) + 1/5*b^2*x^5*e^2*log(c)^2 + 1/2*b^2*d*x^4*e*log(c)^2 - 2/9
*b^2*d^2*n^2*x^3*log(x) + 2/5*a*b*n*x^5*e^2*log(x) + a*b*d*n*x^4*e*log(x) +
 2/3*b^2*d^2*n*x^3*log(c)*log(x) + 2/27*b^2*d^2*n^2*x^3 - 2/25*a*b*n*x^5*e^
2 - 1/4*a*b*d*n*x^4*e - 2/9*b^2*d^2*n*x^3*log(c) + 2/5*a*b*x^5*e^2*log(c) +
 a*b*d*x^4*e*log(c) + 1/3*b^2*d^2*x^3*log(c)^2 + 2/3*a*b*d^2*n*x^3*log(x) -
 2/9*a*b*d^2*n*x^3 + 1/5*a^2*x^5*e^2 + 1/2*a^2*d*x^4*e + 2/3*a*b*d^2*x^3*lo
g(c) + 1/3*a^2*d^2*x^3
```

maple [C] time = 0.32, size = 2597, normalized size = 14.59

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x+d)^2*(b*ln(c*x^n)+a)^2,x)
```

```
[Out] 1/30*b^2*x^3*(6*e^2*x^2+15*d*e*x+10*d^2)*ln(x^n)^2+1/3*ln(c)^2*b^2*d^2*x^3+
1/5*ln(c)^2*b^2*e^2*x^5+1/2*a^2*d*e*x^4+1/3*a^2*d^2*x^3+1/900*b*(450*I*Pi*b
```

*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-300*I*Pi*b*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-450*I*Pi*b*d*e*x^4*csgn(I*c*x^n)^3-300*I*Pi*b*d^2*x^3*csgn(I*c*x^n)^3+360*b*e^2*x^5*ln(c)-72*b*e^2*n*x^5+360*a*e^2*x^5-180*I*Pi*b*e^2*x^5*csgn(I*c*x^n)^3-450*I*Pi*b*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+180*I*Pi*b*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+300*I*Pi*b*d^2*x^3*csgn(I*c*x^n)^2*csgn(I*c)+900*b*d*e*x^4*ln(c)-225*b*d*e*n*x^4+900*a*d*e*x^4-180*I*Pi*b*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+180*I*Pi*b*e^2*x^5*csgn(I*c*x^n)^2*csgn(I*c)+300*I*Pi*b*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+450*I*Pi*b*d*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)+600*b*d^2*x^3*ln(c)-200*b*d^2*n*x^3+600*a*d^2*x^3)*ln(x^n)+1/5*a^2*e^2*x^5-1/3*I*Pi*a*b*d^2*x^3*csgn(I*c*x^n)^3-1/5*I*ln(c)*Pi*b^2*e^2*x^5*csgn(I*c*x^n)^3+1/25*I*Pi*b^2*e^2*n*x^5*csgn(I*c*x^n)^3-1/5*I*Pi*a*b*e^2*x^5*csgn(I*c*x^n)^3+1/4*Pi^2*b^2*d*e*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-2/9*ln(c)*b^2*d^2*n*x^3+2/3*ln(c)*a*b*d^2*x^3+1/2*ln(c)^2*b^2*d*e*x^4+2/5*ln(c)*a*b*e^2*x^5-2/25*ln(c)*b^2*e^2*n*x^5-2/9*a*b*d^2*n*x^3-2/25*a*b*e^2*n*x^5-1/4*ln(c)*b^2*d*e*n*x^4+ln(c)*a*b*d*e*x^4+1/10*Pi^2*b^2*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^5+1/10*Pi^2*b^2*e^2*x^5*csgn(I*c*x^n)^5*csgn(I*c)-1/20*Pi^2*b^2*e^2*x^5*csgn(I*c*x^n)^4*csgn(I*c)^2-1/12*Pi^2*b^2*d^2*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/2*I*Pi*a*b*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*Pi*a*b*d*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1/5*I*ln(c)*Pi*b^2*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2/27*b^2*d^2*n^2*x^3+2/125*b^2*e^2*n^2*x^5-1/2*I*Pi*a*b*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/20*Pi^2*b^2*e^2*x^5*csgn(I*c*x^n)^6-1/12*Pi^2*b^2*d^2*x^3*csgn(I*c*x^n)^6-1/2*I*ln(c)*Pi*b^2*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/8*I*Pi*b^2*d*e*n*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/25*I*Pi*b^2*e^2*n*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/5*I*Pi*a*b*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/5*I*Pi*a*b*e^2*x^5*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*ln(c)*Pi*b^2*d*e*x^4*csgn(I*c*x^n)^3+1/8*I*Pi*b^2*d*e*n*x^4*csgn(I*c*x^n)^3-1/2*I*Pi*a*b*d*e*x^4*csgn(I*c*x^n)^3-1/8*Pi^2*b^2*d*e*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/2*Pi^2*b^2*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/4*Pi^2*b^2*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/5*I*ln(c)*Pi*b^2*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+1/5*I*ln(c)*Pi*b^2*e^2*x^5*csgn(I*c*x^n)^2*csgn(I*c)-1/25*I*Pi*b^2*e^2*n*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2-1/25*I*Pi*b^2*e^2*n*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/5*I*Pi*a*b*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*ln(c)*Pi*b^2*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*ln(c)*Pi*b^2*d*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1/8*I*Pi*b^2*d*e*n*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-1/8*I*Pi*b^2*d*e*n*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/3*I*ln(c)*Pi*b^2*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I*ln(c)*Pi*b^2*d^2*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/9*I*Pi*b^2*d^2*n*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1/9*I*Pi*b^2*d^2*n*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*I*Pi*a*b*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I*Pi*a*b*d^2*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/4*a*b*d*e*n*x^4-1/8*Pi^2*b^2*d*e*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/4*Pi^2*b^2*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^5+1/4*Pi^2*b^2*d*e*x^4*csgn(I*c*x^n)^5*csgn(I*c)-1/8*Pi^2*b^2*d*e*x^4*csgn(I*c*x^n)^4*csgn(I*c)^2+1/9*I*Pi*b^2*d^2*n*x^3*csgn(I*c*x^n)^3-1/3*I*ln(c)*Pi*b^2*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/9*I*Pi*b^2*d^2*n*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*I*Pi*a*b*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*I*ln(c)*Pi*b^2*d^2*x^3*csgn(I*c*x^n)^3+1/6*Pi^2*b^2*d^2*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/12*Pi^2*b^2*d^2*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/3*Pi^2*b^2*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/6*Pi^2*b^2*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/10*Pi^2*b^2*e^2*x^5*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/20*Pi^2*b^2*e^2*x^5*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/5*Pi^2*b^2*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/10*Pi^2*b^2*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-1/8*Pi^2*b^2*d*e*x^4*csgn(I*c*x^n)^6+1/6*Pi^2*b^2*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^5+1/6*Pi^2*b^2*d^2*x^3*csgn(I*c*x^n)^5*csgn(I*c)-1/12*Pi^2*b^2*d^2*x^3*csgn(I*c*x^n)^4*csgn(I*c)^2-1/20*Pi^2*b^2*e^2*x^5*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/16*b^2*d*e*n^2*x^4

maxima [A] time = 0.60, size = 250, normalized size = 1.40

$$\frac{1}{5}\,b^2e^2x^5\log\left(cx^n\right)^2-\frac{2}{25}\,abe^2nx^5+\frac{2}{5}\,abe^2x^5\log\left(cx^n\right)+\frac{1}{2}\,b^2dex^4\log\left(cx^n\right)^2-\frac{1}{4}\,abdenx^4+\frac{1}{5}\,a^2e^2x^5+abdex^4\log\left(cx\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x+d)^2*(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] 1/5*b^2*e^2*x^5*log(c*x^n)^2 - 2/25*a*b*e^2*n*x^5 + 2/5*a*b*e^2*x^5*log(c*x
^n) + 1/2*b^2*d*e*x^4*log(c*x^n)^2 - 1/4*a*b*d*e*n*x^4 + 1/5*a^2*e^2*x^5 +
a*b*d*e*x^4*log(c*x^n) + 1/3*b^2*d^2*x^3*log(c*x^n)^2 - 2/9*a*b*d^2*n*x^3 +
 1/2*a^2*d*e*x^4 + 2/3*a*b*d^2*x^3*log(c*x^n) + 1/3*a^2*d^2*x^3 + 2/27*(n^2
*x^3 - 3*n*x^3*log(c*x^n))*b^2*d^2 + 1/16*(n^2*x^4 - 4*n*x^4*log(c*x^n))*b^
2*d*e + 2/125*(n^2*x^5 - 5*n*x^5*log(c*x^n))*b^2*e^2
```

mupad [B] time = 3.74, size = 180, normalized size = 1.01

$$\ln\left(c\,x^n\right)\,\left(\frac{2\,b\,\left(3\,a-b\,n\right)\,d^2\,x^3}{9}+\frac{b\,\left(4\,a-b\,n\right)\,d\,e\,x^4}{4}+\frac{2\,b\,\left(5\,a-b\,n\right)\,e^2\,x^5}{25}\right)+\ln\left(c\,x^n\right)^2\,\left(\frac{b^2\,d^2\,x^3}{3}+\frac{b^2\,d\,e\,x^4}{2}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*log(c*x^n))^2*(d + e*x)^2,x)
```

```
[Out] log(c*x^n)*((2*b*d^2*x^3*(3*a - b*n))/9 + (2*b*e^2*x^5*(5*a - b*n))/25 + (b
*d*e*x^4*(4*a - b*n))/4) + log(c*x^n)^2*((b^2*d^2*x^3)/3 + (b^2*e^2*x^5)/5
+ (b^2*d*e*x^4)/2) + (d^2*x^3*(9*a^2 + 2*b^2*n^2 - 6*a*b*n))/27 + (e^2*x^5*
(25*a^2 + 2*b^2*n^2 - 10*a*b*n))/125 + (d*e*x^4*(8*a^2 + b^2*n^2 - 4*a*b*n)
)/16
```

sympy [B] time = 4.82, size = 517, normalized size = 2.90

$$\frac{a^2d^2x^3}{3}+\frac{a^2dex^4}{2}+\frac{a^2e^2x^5}{5}+\frac{2abd^2nx^3\log\left(x\right)}{3}-\frac{2abd^2nx^3}{9}+\frac{2abd^2x^3\log\left(c\right)}{3}+abdenx^4\log\left(x\right)-\frac{abdenx^4}{4}+abdex^4\,\mathrm{lo}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x+d)**2*(a+b*ln(c*x**n))**2,x)
```

```
[Out] a**2*d**2*x**3/3 + a**2*d*e*x**4/2 + a**2*e**2*x**5/5 + 2*a*b*d**2*n*x**3*l
og(x)/3 - 2*a*b*d**2*n*x**3/9 + 2*a*b*d**2*x**3*log(c)/3 + a*b*d*e*n*x**4*l
og(x) - a*b*d*e*n*x**4/4 + a*b*d*e*x**4*log(c) + 2*a*b*e**2*n*x**5*log(x)/5
 - 2*a*b*e**2*n*x**5/25 + 2*a*b*e**2*x**5*log(c)/5 + b**2*d**2*n**2*x**3*lo
g(x)**2/3 - 2*b**2*d**2*n**2*x**3*log(x)/9 + 2*b**2*d**2*n**2*x**3/27 + 2*b
**2*d**2*n*x**3*log(c)*log(x)/3 - 2*b**2*d**2*n*x**3*log(c)/9 + b**2*d**2*x
**3*log(c)**2/3 + b**2*d*e*n**2*x**4*log(x)**2/2 - b**2*d*e*n**2*x**4*log(x
)/4 + b**2*d*e*n**2*x**4/16 + b**2*d*e*n*x**4*log(c)*log(x) - b**2*d*e*n*x*
*4*log(c)/4 + b**2*d*e*x**4*log(c)**2/2 + b**2*e**2*n**2*x**5*log(x)**2/5 -
 2*b**2*e**2*n**2*x**5*log(x)/25 + 2*b**2*e**2*n**2*x**5/125 + 2*b**2*e**2*
n*x**5*log(c)*log(x)/5 - 2*b**2*e**2*n*x**5*log(c)/25 + b**2*e**2*x**5*log(
c)**2/5
```

3.85 $\int x(d+ex)^2 \left(a+b\log\left(cx^n\right)\right)^2 \, dx$

Optimal. Leaf size=178

$$\frac{1}{2}d^2x^2\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{2}bd^2nx^2\left(a+b\log\left(cx^n\right)\right)+\frac{2}{3}dex^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{4}{9}bdenx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}e^2x^4\left(\right.$$

```
[Out] 1/4*b^2*d^2*n^2*x^2+4/27*b^2*d*e*n^2*x^3+1/32*b^2*e^2*n^2*x^4-1/2*b*d^2*n*x
^2*(a+b*ln(c*x^n))-4/9*b*d*e*n*x^3*(a+b*ln(c*x^n))-1/8*b*e^2*n*x^4*(a+b*ln(
c*x^n))+1/2*d^2*x^2*(a+b*ln(c*x^n))^2+2/3*d*e*x^3*(a+b*ln(c*x^n))^2+1/4*e^2
*x^4*(a+b*ln(c*x^n))^2
```

Rubi [A] time = 0.18, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2353, 2305, 2304}

$$\frac{1}{2}d^2x^2\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{2}bd^2nx^2\left(a+b\log\left(cx^n\right)\right)+\frac{2}{3}dex^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{4}{9}bdenx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}e^2x^4\left(\right.$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x)^2*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (b^2*d^2*n^2*x^2)/4 + (4*b^2*d*e*n^2*x^3)/27 + (b^2*e^2*n^2*x^4)/32 - (b*d^
2*n*x^2*(a + b*Log[c*x^n]))/2 - (4*b*d*e*n*x^3*(a + b*Log[c*x^n]))/9 - (b*e
^2*n*x^4*(a + b*Log[c*x^n]))/8 + (d^2*x^2*(a + b*Log[c*x^n])^2)/2 + (2*d*e*
x^3*(a + b*Log[c*x^n])^2)/3 + (e^2*x^4*(a + b*Log[c*x^n])^2)/4
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\begin{aligned}
\int x(d+ex)^2\left(a+b\log\left(cx^n\right)\right)^2 \, dx &= \int \left(d^2x\left(a+b\log\left(cx^n\right)\right)^2+2dex^2\left(a+b\log\left(cx^n\right)\right)^2+e^2x^3\left(a+b\log\left(cx^n\right)\right)\right.\\
&= d^2\int x\left(a+b\log\left(cx^n\right)\right)^2 \, dx+(2de)\int x^2\left(a+b\log\left(cx^n\right)\right)^2 \, dx+e^2\int x^3\left(a\right.\\
&= \frac{1}{2}d^2x^2\left(a+b\log\left(cx^n\right)\right)^2+\frac{2}{3}dex^3\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{4}e^2x^4\left(a+b\log\left(cx^n\right)\right.\\
&= \frac{1}{4}b^2d^2n^2x^2+\frac{4}{27}b^2den^2x^3+\frac{1}{32}b^2e^2n^2x^4-\frac{1}{2}bd^2nx^2\left(a+b\log\left(cx^n\right)\right)-\frac{4}{9}bd
\end{aligned}$$

Mathematica [A] time = 0.09, size = 134, normalized size = 0.75

$$\frac{1}{864}x^2\left(432d^2\left(a+b\log\left(cx^n\right)\right)^2+216bd^2n\left(-2a-2b\log\left(cx^n\right)+bn\right)+576dex\left(a+b\log\left(cx^n\right)\right)^2+128bdenx\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x)^2*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (x^2*(27*b*e^2*n*x^2*(-4*a + b*n - 4*b*Log[c*x^n]) + 128*b*d*e*n*x*(-3*a +
b*n - 3*b*Log[c*x^n]) + 216*b*d^2*n*(-2*a + b*n - 2*b*Log[c*x^n]) + 432*d^2
*(a + b*Log[c*x^n])^2 + 576*d*e*x*(a + b*Log[c*x^n])^2 + 216*e^2*x^2*(a + b
*Log[c*x^n])^2))/864
```

fricas [B] time = 0.48, size = 363, normalized size = 2.04

$$\frac{1}{32}\left(b^2e^2n^2-4\,abe^2n+8\,a^2e^2\right)x^4+\frac{2}{27}\left(2\,b^2den^2-6\,abden+9\,a^2de\right)x^3+\frac{1}{4}\left(b^2d^2n^2-2\,abd^2n+2\,a^2d^2\right)x^2+\frac{1}{12}\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)^2*(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] 1/32*(b^2*e^2*n^2 - 4*a*b*e^2*n + 8*a^2*e^2)*x^4 + 2/27*(2*b^2*d*e*n^2 - 6*
a*b*d*e*n + 9*a^2*d*e)*x^3 + 1/4*(b^2*d^2*n^2 - 2*a*b*d^2*n + 2*a^2*d^2)*x^
2 + 1/12*(3*b^2*e^2*x^4 + 8*b^2*d*e*x^3 + 6*b^2*d^2*x^2)*log(c)^2 + 1/12*(3
*b^2*e^2*n^2*x^4 + 8*b^2*d*e*n^2*x^3 + 6*b^2*d^2*n^2*x^2)*log(x)^2 - 1/72*(
9*(b^2*e^2*n - 4*a*b*e^2)*x^4 + 32*(b^2*d*e*n - 3*a*b*d*e)*x^3 + 36*(b^2*d^
2*n - 2*a*b*d^2)*x^2)*log(c) - 1/72*(9*(b^2*e^2*n^2 - 4*a*b*e^2*n)*x^4 + 32
*(b^2*d*e*n^2 - 3*a*b*d*e*n)*x^3 + 36*(b^2*d^2*n^2 - 2*a*b*d^2*n)*x^2 - 12*
(3*b^2*e^2*n*x^4 + 8*b^2*d*e*n*x^3 + 6*b^2*d^2*n*x^2)*log(c))*log(x)
```

giac [B] time = 0.32, size = 408, normalized size = 2.29

$$\frac{1}{4}\,b^2n^2x^4e^2\log(x)^2+\frac{2}{3}\,b^2dn^2x^3e\log(x)^2-\frac{1}{8}\,b^2n^2x^4e^2\log(x)-\frac{4}{9}\,b^2dn^2x^3e\log(x)+\frac{1}{2}\,b^2nx^4e^2\log(c)\log(x)+\frac{4}{3}\,b^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)^2*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] 1/4*b^2*n^2*x^4*e^2*log(x)^2 + 2/3*b^2*d*n^2*x^3*e*log(x)^2 - 1/8*b^2*n^2*x
^4*e^2*log(x) - 4/9*b^2*d*n^2*x^3*e*log(x) + 1/2*b^2*n*x^4*e^2*log(c)*log(x
) + 4/3*b^2*d*n*x^3*e*log(c)*log(x) + 1/2*b^2*d^2*n^2*x^2*log(x)^2 + 1/32*b
^2*n^2*x^4*e^2 + 4/27*b^2*d*n^2*x^3*e - 1/8*b^2*n*x^4*e^2*log(c) - 4/9*b^2*
d*n*x^3*e*log(c) + 1/4*b^2*x^4*e^2*log(c)^2 + 2/3*b^2*d*x^3*e*log(c)^2 - 1/
2*b^2*d^2*n^2*x^2*log(x) + 1/2*a*b*n*x^4*e^2*log(x) + 4/3*a*b*d*n*x^3*e*log
(x) + b^2*d^2*n*x^2*log(c)*log(x) + 1/4*b^2*d^2*n^2*x^2 - 1/8*a*b*n*x^4*e^2
 - 4/9*a*b*d*n*x^3*e - 1/2*b^2*d^2*n*x^2*log(c) + 1/2*a*b*x^4*e^2*log(c) +
4/3*a*b*d*x^3*e*log(c) + 1/2*b^2*d^2*x^2*log(c)^2 + a*b*d^2*n*x^2*log(x) -
1/2*a*b*d^2*n*x^2 + 1/4*a^2*x^4*e^2 + 2/3*a^2*d*x^3*e + a*b*d^2*x^2*log(c)
+ 1/2*a^2*d^2*x^2
```

maple [C] time = 0.32, size = 2597, normalized size = 14.59

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x+d)^2*(b*ln(c*x^n)+a)^2,x)
```

```
[Out] -1/8*b*n*a*e^2*x^4-1/2*b*n*a*d^2*x^2+1/3*Pi^2*b^2*d*e*x^3*csgn(I*c*x^n)^5*c
sgn(I*c)+1/12*b^2*x^2*(3*e^2*x^2+8*d*e*x+6*d^2)*ln(x^n)^2+1/4*ln(c)^2*b^2*e
```

^2*x^4+1/2*ln(c)^2*b^2*d^2*x^2+1/4*a^2*e^2*x^4+1/72*b*(48*I*Pi*b*d*e*x^3*cs
gn(I*x^n)*csgn(I*c*x^n)^2-36*I*Pi*b*d^2*x^2*csgn(I*c*x^n)^3+18*I*Pi*b*e^2*x
^4*csgn(I*x^n)*csgn(I*c*x^n)^2-36*I*Pi*b*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+36*b*e^2*x^4*ln(c)-9*b*e^2*n*x^4+36*a*e^2*x^4-48*I*Pi*b*d*e*x^3*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3-48*I*P
i*b*d*e*x^3*csgn(I*c*x^n)^3+36*I*Pi*b*d^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+96*
b*d*e*x^3*ln(c)-32*b*d*e*n*x^3+96*a*d*e*x^3+36*I*Pi*b*d^2*x^2*csgn(I*x^n)*c
sgn(I*c*x^n)^2-18*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+18*I*P
i*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+48*I*Pi*b*d*e*x^3*csgn(I*c*x^n)^2*csg
n(I*c)+72*b*d^2*x^2*ln(c)-36*b*d^2*n*x^2+72*a*d^2*x^2)*ln(x^n)+2/3*a^2*d*e*
x^3+1/2*a^2*d^2*x^2-1/4*I*Pi*a*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)-1/2*I*ln(c)*Pi*b^2*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi*b
^2*d^2*n*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/16*I*Pi*b^2*e^2*n*x^4*cs
gn(I*x^n)*csgn(I*c*x^n)^2-1/16*I*Pi*b^2*e^2*n*x^4*csgn(I*c*x^n)^2*csgn(I*c)
+1/4*I*Pi*a*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-2/9*I*Pi*b^2*d*e*n*x^3*cs
gn(I*x^n)*csgn(I*c*x^n)^2-2/9*I*Pi*b^2*d*e*n*x^3*csgn(I*c*x^n)^2*csgn(I*c)+
2/3*I*Pi*a*b*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+2/3*I*Pi*a*b*d*e*x^3*csgn(
I*c*x^n)^2*csgn(I*c)-4/9*b*n*a*d*e*x^3+1/2*ln(c)*a*b*e^2*x^4-1/2*ln(c)*b^2*
d^2*n*x^2+ln(c)*a*b*d^2*x^2+2/3*ln(c)^2*b^2*d*e*x^3-1/2*I*ln(c)*Pi*b^2*d^2*
x^2*csgn(I*c*x^n)^3+1/4*I*Pi*b^2*d^2*n*x^2*csgn(I*c*x^n)^3-1/8*ln(c)*b^2*e^
2*n*x^4-1/6*Pi^2*b^2*d*e*x^3*csgn(I*c*x^n)^4*csgn(I*c)^2+1/8*Pi^2*b^2*e^2*x
^4*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-1/6*Pi^2*b^2*d*e*x^3*csgn(I*x^n)
^2*csgn(I*c*x^n)^4+1/3*Pi^2*b^2*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^5-1/2*I*P
i*a*b*d^2*x^2*csgn(I*c*x^n)^3-1/4*I*ln(c)*Pi*b^2*e^2*x^4*csgn(I*c*x^n)^3+1/
16*I*Pi*b^2*e^2*n*x^4*csgn(I*c*x^n)^3-1/4*I*Pi*a*b*e^2*x^4*csgn(I*c*x^n)^3-
1/8*Pi^2*b^2*d^2*x^2*csgn(I*c*x^n)^6-1/16*Pi^2*b^2*e^2*x^4*csgn(I*c*x^n)^6-
4/9*ln(c)*b^2*d*e*n*x^3+4/3*ln(c)*a*b*d*e*x^3-1/8*Pi^2*b^2*d^2*x^2*csgn(I*x
^n)^2*csgn(I*c*x^n)^4+1/4*Pi^2*b^2*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^5+1/4*
Pi^2*b^2*d^2*x^2*csgn(I*c*x^n)^5*csgn(I*c)-1/8*Pi^2*b^2*d^2*x^2*csgn(I*c*x^
n)^4*csgn(I*c)^2-1/16*Pi^2*b^2*e^2*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/8*Pi
^2*b^2*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^5+2/9*I*Pi*b^2*d*e*n*x^3*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-2/3*I*Pi*a*b*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)+1/4*b^2*d^2*n^2*x^2+1/32*b^2*e^2*n^2*x^4-2/3*I*ln(c)*Pi*b^2*d*e*x^
3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/16*I*Pi*b^2*e^2*n*x^4*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+1/4*Pi^2*b^2*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csg
n(I*c)^2+1/8*Pi^2*b^2*e^2*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/16*
Pi^2*b^2*e^2*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/4*Pi^2*b^2*e^2
*x^4*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/3*Pi^2*b^2*d*e*x^3*csgn(I*x^n)
^2*csgn(I*c*x^n)^3*csgn(I*c)+1/2*I*Pi*a*b*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)
^2+1/2*I*Pi*a*b*d^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*ln(c)*Pi*b^2*e^2*x^
4*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*ln(c)*Pi*b^2*e^2*x^4*csgn(I*c*x^n)^2*cs
gn(I*c)-1/6*Pi^2*b^2*d*e*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-2/3*
Pi^2*b^2*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/3*Pi^2*b^2*d*e*x^3
*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/4*I*Pi*a*b*e^2*x^4*csgn(I*c*x^n)
^2*csgn(I*c)-2/3*I*ln(c)*Pi*b^2*d*e*x^3*csgn(I*c*x^n)^3+2/9*I*Pi*b^2*d*e*n*
x^3*csgn(I*c*x^n)^3-2/3*I*Pi*a*b*d*e*x^3*csgn(I*c*x^n)^3+1/2*I*ln(c)*Pi*b^2
*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*ln(c)*Pi*b^2*d^2*x^2*csgn(I*c*x^
n)^2*csgn(I*c)-1/4*I*Pi*b^2*d^2*n*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*Pi*
b^2*d^2*n*x^2*csgn(I*c*x^n)^2*csgn(I*c)-1/4*I*ln(c)*Pi*b^2*e^2*x^4*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)+1/8*Pi^2*b^2*e^2*x^4*csgn(I*c*x^n)^5*csgn(I*c)-
1/16*Pi^2*b^2*e^2*x^4*csgn(I*c*x^n)^4*csgn(I*c)^2-1/6*Pi^2*b^2*d*e*x^3*csgn
(I*c*x^n)^6-1/2*I*Pi*a*b*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2/3*I*
ln(c)*Pi*b^2*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+2/3*I*ln(c)*Pi*b^2*d*e*x^3
*csgn(I*c*x^n)^2*csgn(I*c)+4/27*b^2*d*e*n^2*x^3+1/4*Pi^2*b^2*d^2*x^2*csgn(I
*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/8*Pi^2*b^2*d^2*x^2*csgn(I*x^n)^2*csgn(I
*c*x^n)^2*csgn(I*c)^2-1/2*Pi^2*b^2*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn
(I*c)

maxima [A] time = 0.52, size = 250, normalized size = 1.40

$$\frac{1}{4}\,b^{2}e^{2}x^{4}\log\left(cx^{n}\right)^{2}-\frac{1}{8}\,abe^{2}nx^{4}+\frac{1}{2}\,abe^{2}x^{4}\log\left(cx^{n}\right)+\frac{2}{3}\,b^{2}dex^{3}\log\left(cx^{n}\right)^{2}-\frac{4}{9}\,abdenx^{3}+\frac{1}{4}\,a^{2}e^{2}x^{4}+\frac{4}{3}\,abdex^{3}\log\left(c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)^2*(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] 1/4*b^2*e^2*x^4*log(c*x^n)^2 - 1/8*a*b*e^2*n*x^4 + 1/2*a*b*e^2*x^4*log(c*x^
n) + 2/3*b^2*d*e*x^3*log(c*x^n)^2 - 4/9*a*b*d*e*n*x^3 + 1/4*a^2*e^2*x^4 + 4
/3*a*b*d*e*x^3*log(c*x^n) + 1/2*b^2*d^2*x^2*log(c*x^n)^2 - 1/2*a*b*d^2*n*x^
2 + 2/3*a^2*d*e*x^3 + a*b*d^2*x^2*log(c*x^n) + 1/2*a^2*d^2*x^2 + 1/4*(n^2*x
^2 - 2*n*x^2*log(c*x^n))*b^2*d^2 + 4/27*(n^2*x^3 - 3*n*x^3*log(c*x^n))*b^2*
d*e + 1/32*(n^2*x^4 - 4*n*x^4*log(c*x^n))*b^2*e^2
```

mupad [B] time = 3.62, size = 179, normalized size = 1.01

$$\ln\left(c\,x^{n}\right)\,\left(\frac{b\,\left(2\,a-b\,n\right)\,d^{2}\,x^{2}}{2}+\frac{4\,b\,\left(3\,a-b\,n\right)\,d\,e\,x^{3}}{9}+\frac{b\,\left(4\,a-b\,n\right)\,e^{2}\,x^{4}}{8}\right)+\ln\left(c\,x^{n}\right)^{2}\,\left(\frac{b^{2}\,d^{2}\,x^{2}}{2}+\frac{2\,b^{2}\,d\,e\,x^{3}}{3}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*log(c*x^n))^2*(d + e*x)^2,x)
```

```
[Out] log(c*x^n)*((b*d^2*x^2*(2*a - b*n))/2 + (b*e^2*x^4*(4*a - b*n))/8 + (4*b*d*
e*x^3*(3*a - b*n))/9) + log(c*x^n)^2*((b^2*d^2*x^2)/2 + (b^2*e^2*x^4)/4 + (
2*b^2*d*e*x^3)/3) + (d^2*x^2*(2*a^2 + b^2*n^2 - 2*a*b*n))/4 + (e^2*x^4*(8*a
^2 + b^2*n^2 - 4*a*b*n))/32 + (2*d*e*x^3*(9*a^2 + 2*b^2*n^2 - 6*a*b*n))/27
```

sympy [B] time = 3.27, size = 510, normalized size = 2.87

$$\frac{a^{2}d^{2}x^{2}}{2}+\frac{2a^{2}dex^{3}}{3}+\frac{a^{2}e^{2}x^{4}}{4}+abd^{2}nx^{2}\log\left(x\right)-\frac{abd^{2}nx^{2}}{2}+abd^{2}x^{2}\log\left(c\right)+\frac{4abdenx^{3}\log\left(x\right)}{3}-\frac{4abdenx^{3}}{9}+\frac{4abdex^{3}\,\mathrm{l}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)**2*(a+b*ln(c*x**n))**2,x)
```

```
[Out] a**2*d**2*x**2/2 + 2*a**2*d*e*x**3/3 + a**2*e**2*x**4/4 + a*b*d**2*n*x**2*l
og(x) - a*b*d**2*n*x**2/2 + a*b*d**2*x**2*log(c) + 4*a*b*d*e*n*x**3*log(x)/
3 - 4*a*b*d*e*n*x**3/9 + 4*a*b*d*e*x**3*log(c)/3 + a*b*e**2*n*x**4*log(x)/2
 - a*b*e**2*n*x**4/8 + a*b*e**2*x**4*log(c)/2 + b**2*d**2*n**2*x**2*log(x)*
*2/2 - b**2*d**2*n**2*x**2*log(x)/2 + b**2*d**2*n**2*x**2/4 + b**2*d**2*n*x
**2*log(c)*log(x) - b**2*d**2*n*x**2*log(c)/2 + b**2*d**2*x**2*log(c)**2/2
+ 2*b**2*d*e*n**2*x**3*log(x)**2/3 - 4*b**2*d*e*n**2*x**3*log(x)/9 + 4*b**2
*d*e*n**2*x**3/27 + 4*b**2*d*e*n*x**3*log(c)*log(x)/3 - 4*b**2*d*e*n*x**3*l
og(c)/9 + 2*b**2*d*e*x**3*log(c)**2/3 + b**2*e**2*n**2*x**4*log(x)**2/4 - b
**2*e**2*n**2*x**4*log(x)/8 + b**2*e**2*n**2*x**4/32 + b**2*e**2*n*x**4*log
(c)*log(x)/2 - b**2*e**2*n*x**4*log(c)/8 + b**2*e**2*x**4*log(c)**2/4
```

3.86 $\int (d+ex)^2 \left(a+b\log\left(cx^n\right)\right)^2 \, dx$

Optimal. Leaf size=173

$$-\frac{2bd^3n\log(x)\left(a+b\log\left(cx^n\right)\right)}{3e}-2bd^2nx\left(a+b\log\left(cx^n\right)\right)+\frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)^2}{3e}-bdenx^2\left(a+b\log\left(cx^n\right)\right)-$$

```
[Out] 2*b^2*d^2*n^2*x+1/2*b^2*d*e*n^2*x^2+2/27*b^2*e^2*n^2*x^3+1/3*b^2*d^3*n^2*ln
(x)^2/e-2*b*d^2*n*x*(a+b*ln(c*x^n))-b*d*e*n*x^2*(a+b*ln(c*x^n))-2/9*b*e^2*n
*x^3*(a+b*ln(c*x^n))-2/3*b*d^3*n*ln(x)*(a+b*ln(c*x^n))/e+1/3*(e*x+d)^3*(a+b
*ln(c*x^n))^2/e
```

Rubi [A] time = 0.13, antiderivative size = 141, normalized size of antiderivative = 0.82, number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2319, 43, 2334, 2301}

$$-\frac{bn\left(18d^2ex+6d^3\log(x)+9de^2x^2+2e^3x^3\right)\left(a+b\log\left(cx^n\right)\right)}{9e}+\frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)^2}{3e}+\frac{b^2d^3n^2\log^2(x)}{3e}+2b^2$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)^2*(a + b*Log[c*x^n])^2,x]
```

```
[Out] 2*b^2*d^2*n^2*x + (b^2*d*e*n^2*x^2)/2 + (2*b^2*e^2*n^2*x^3)/27 + (b^2*d^3*n
^2*Log[x]^2)/(3*e) - (b*n*(18*d^2*e*x + 9*d*e^2*x^2 + 2*e^3*x^3 + 6*d^3*Log
[x])*(a + b*Log[c*x^n]))/(9*e) + ((d + e*x)^3*(a + b*Log[c*x^n])^2)/(3*e)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int (d+ex)^2 \left(a+b\log\left(cx^n\right)\right)^2 dx = \frac{(d+ex)^3 \left(a+b\log\left(cx^n\right)\right)^2}{3e} - \frac{(2bn)\int \frac{(d+ex)^3\left(a+b\log\left(cx^n\right)\right)}{x}dx}{3e}$$
$$= -\frac{bn\left(18d^2ex+9de^2x^2+2e^3x^3+6d^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)}{9e} + \frac{(d+ex)^3}{}$$
$$= -\frac{bn\left(18d^2ex+9de^2x^2+2e^3x^3+6d^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)}{9e} + \frac{(d+ex)^3}{}$$
$$= 2b^2d^2n^2x + \frac{1}{2}b^2den^2x^2 + \frac{2}{27}b^2e^2n^2x^3 + \frac{b^2d^3n^2\log^2(x)}{3e} - \frac{bn\left(18d^2ex+9d\right.}{}$$

Mathematica [A] time = 0.08, size = 135, normalized size = 0.78

$$d^2x\left(a+b\log\left(cx^n\right)\right)^2 - 2bd^2nx\left(a+b\log\left(cx^n\right)-bn\right) + dex^2\left(a+b\log\left(cx^n\right)\right)^2 + \frac{1}{2}bdenx^2\left(-2a-2b\log\left(cx^n\right)+b\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)^2*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b*e^2*n*x^3*(-3*a + b*n - 3*b*Log[c*x^n]))/27 + (b*d*e*n*x^2*(-2*a + b*n
 - 2*b*Log[c*x^n]))/2 + d^2*x*(a + b*Log[c*x^n])^2 + d*e*x^2*(a + b*Log[c*x
^n])^2 + (e^2*x^3*(a + b*Log[c*x^n])^2)/3 - 2*b*d^2*n*x*(a - b*n + b*Log[c*
x^n])
```

fricas [B] time = 0.78, size = 347, normalized size = 2.01

$$\frac{1}{27}\left(2\,b^2e^2n^2 - 6\,abe^2n + 9\,a^2e^2\right)x^3 + \frac{1}{2}\left(b^2den^2 - 2\,abden + 2\,a^2de\right)x^2 + \frac{1}{3}\left(b^2e^2x^3 + 3\,b^2dex^2 + 3\,b^2d^2x\right)\log(c)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] 1/27*(2*b^2*e^2*n^2 - 6*a*b*e^2*n + 9*a^2*e^2)*x^3 + 1/2*(b^2*d*e*n^2 - 2*a
*b*d*e*n + 2*a^2*d*e)*x^2 + 1/3*(b^2*e^2*x^3 + 3*b^2*d*e*x^2 + 3*b^2*d^2*x)
*log(c)^2 + 1/3*(b^2*e^2*n^2*x^3 + 3*b^2*d*e*n^2*x^2 + 3*b^2*d^2*n^2*x)*log
(x)^2 + (2*b^2*d^2*n^2 - 2*a*b*d^2*n + a^2*d^2)*x - 1/9*(2*(b^2*e^2*n - 3*a
*b*e^2)*x^3 + 9*(b^2*d*e*n - 2*a*b*d*e)*x^2 + 18*(b^2*d^2*n - a*b*d^2)*x)*l
og(c) - 1/9*(2*(b^2*e^2*n^2 - 3*a*b*e^2*n)*x^3 + 9*(b^2*d*e*n^2 - 2*a*b*d*e
*n)*x^2 + 18*(b^2*d^2*n^2 - a*b*d^2*n)*x - 6*(b^2*e^2*n*x^3 + 3*b^2*d*e*n*x
^2 + 3*b^2*d^2*n*x)*log(c))*log(x)
```

giac [B] time = 0.36, size = 385, normalized size = 2.23

$$\frac{1}{3}\,b^2n^2x^3e^2\log(x)^2 + b^2dn^2x^2e\log(x)^2 - \frac{2}{9}\,b^2n^2x^3e^2\log(x) - b^2dn^2x^2e\log(x) + \frac{2}{3}\,b^2nx^3e^2\log(c)\log(x) + 2\,b^2dnx^2e$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] 1/3*b^2*n^2*x^3*e^2*log(x)^2 + b^2*d*n^2*x^2*e*log(x)^2 - 2/9*b^2*n^2*x^3*e
^2*log(x) - b^2*d*n^2*x^2*e*log(x) + 2/3*b^2*n*x^3*e^2*log(c)*log(x) + 2*b^
2*d*n*x^2*e*log(c)*log(x) + b^2*d^2*n^2*x*log(x)^2 + 2/27*b^2*n^2*x^3*e^2 +
 1/2*b^2*d*n^2*x^2*e - 2/9*b^2*n*x^3*e^2*log(c) - b^2*d*n*x^2*e*log(c) + 1/
3*b^2*x^3*e^2*log(c)^2 + b^2*d*x^2*e*log(c)^2 - 2*b^2*d^2*n^2*x*log(x) + 2/
3*a*b*n*x^3*e^2*log(x) + 2*a*b*d*n*x^2*e*log(x) + 2*b^2*d^2*n*x*log(c)*log(
```

```
x) + 2*b^2*d^2*n^2*x - 2/9*a*b*n*x^3*e^2 - a*b*d*n*x^2*e - 2*b^2*d^2*n*x*lo
g(c) + 2/3*a*b*x^3*e^2*log(c) + 2*a*b*d*x^2*e*log(c) + b^2*d^2*x*log(c)^2 +
 2*a*b*d^2*n*x*log(x) - 2*a*b*d^2*n*x + 1/3*a^2*x^3*e^2 + a^2*d*x^2*e + 2*a
*b*d^2*x*log(c) + a^2*d^2*x
```

maple [C] time = 0.42, size = 2565, normalized size = 14.83

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(b*ln(c*x^n)+a)^2,x)
```

```
[Out] -2*b*n*a*d^2*x+1/3*ln(c)^2*b^2*e^2*x^3+ln(c)^2*b^2*d^2*x-1/9*b*(-9*I*Pi*b*d
*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-9*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)
^2*e*x-3*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)+9*I*Pi*b*d^2*csgn(I*c*x^n
)^3*e*x+9*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3+3*I*Pi*b*e^3*x^3*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)-3*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-9*I*Pi*b*
d^2*csgn(I*c*x^n)^2*csgn(I*c)*e*x+9*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*e*x-9*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+3*I*Pi*b*e^3*x^3*c
sgn(I*c*x^n)^3+9*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-6*b*e
^3*x^3*ln(c)+2*b*e^3*n*x^3-18*b*d*e^2*x^2*ln(c)-6*a*e^3*x^3+9*b*d*e^2*n*x^2
+6*b*d^3*n*ln(x)-18*b*d^2*e*x*ln(c)-18*a*d*e^2*x^2+18*b*d^2*e*n*x-18*a*d^2*
e*x)/e*ln(x^n)+1/3*(e*x+d)^3*b^2/e*ln(x^n)^2-2/9*b*n*a*e^2*x^3+1/3*a^2*e^2*
x^3+a^2*d^2*x+a^2*d*e*x^2+1/3*b^2*d^3*n^2*ln(x)^2/e-1/12*e^2*Pi^2*b^2*x^3*c
sgn(I*c*x^n)^4*csgn(I*c)^2-1/4*e*Pi^2*b^2*d*x^2*csgn(I*c*x^n)^6-1/4*Pi^2*b^
2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4*x+1/2*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c
*x^n)^5*x+1/2*Pi^2*b^2*d^2*csgn(I*c*x^n)^5*csgn(I*c)*x-1/4*Pi^2*b^2*d^2*csg
n(I*c*x^n)^4*csgn(I*c)^2*x+2*ln(c)*a*b*d*e*x^2-ln(c)*b^2*d*e*n*x^2-1/4*e*Pi
^2*b^2*d*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-e*Pi^2*b^2*d*x^2*csg
n(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)-b*n*a*d*e*x^2-2/9*ln(c)*b^2*e^2*n*x^3+ln
(c)^2*b^2*d*e*x^2+2/3*ln(c)*a*b*e^2*x^3-2*ln(c)*b^2*d^2*n*x+2*ln(c)*a*b*d^2
*x-1/12*e^2*Pi^2*b^2*x^3*csgn(I*c*x^n)^6-1/4*Pi^2*b^2*d^2*csgn(I*c*x^n)^6*x
-I*e*ln(c)*Pi*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*e*Pi*b^2*
d*n*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*e*Pi*a*b*d*x^2*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-1/12*e^2*Pi^2*b^2*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1
/6*e^2*Pi^2*b^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^5+1/6*e^2*Pi^2*b^2*x^3*csgn(I
*c*x^n)^5*csgn(I*c)+2*b^2*d^2*n^2*x+2/27*b^2*e^2*n^2*x^3+1/2*Pi^2*b^2*d^2*c
sgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x-1/4*Pi^2*b^2*d^2*csgn(I*x^n)^2*csg
n(I*c*x^n)^2*csgn(I*c)^2*x-Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*
c)*x+1/2*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*x+I*Pi*b^2*d^
2*n*x*csgn(I*c*x^n)^3+1/6*e^2*Pi^2*b^2*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^3*cs
gn(I*c)-1/12*e^2*Pi^2*b^2*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/3
*e^2*Pi^2*b^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/6*e^2*Pi^2*b^2*x^
3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-1/4*e*Pi^2*b^2*d*x^2*csgn(I*x^n)^
2*csgn(I*c*x^n)^4+1/2*e*Pi^2*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^5+1/2*e*Pi
^2*b^2*d*x^2*csgn(I*c*x^n)^5*csgn(I*c)-1/4*e*Pi^2*b^2*d*x^2*csgn(I*c*x^n)^4
*csgn(I*c)^2-I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^3*x-I*Pi*a*b*d^2*csgn(I*c*x^n
)^3*x+1/9*I*e^2*Pi*b^2*n*x^3*csgn(I*c*x^n)^3-1/3*I*e^2*Pi*a*b*x^3*csgn(I*c*
x^n)^3-1/3*I*e^2*ln(c)*Pi*b^2*x^3*csgn(I*c*x^n)^3+1/2*e*Pi^2*b^2*d*x^2*csgn
(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c
*x^n)^2*x+I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)*x+I*Pi*a*b*d^2*csgn(
I*x^n)*csgn(I*c*x^n)^2*x+I*Pi*a*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)*x+1/2*e*Pi^
2*b^2*d*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-I*e*ln(c)*Pi*b^2*d*x^2*
csgn(I*c*x^n)^3+1/3*I*e^2*Pi*a*b*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*e*Pi
*b^2*d*n*x^2*csgn(I*c*x^n)^3+1/3*I*e^2*Pi*a*b*x^3*csgn(I*c*x^n)^2*csgn(I*c)
-I*e*Pi*a*b*d*x^2*csgn(I*c*x^n)^3+1/3*I*e^2*ln(c)*Pi*b^2*x^3*csgn(I*x^n)*cs
gn(I*c*x^n)^2-1/9*I*e^2*Pi*b^2*n*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1/9*I*e^2*
Pi*b^2*n*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*I*e^2*ln(c)*Pi*b^2*x^3*csgn(I*c*
x^n)^2*csgn(I*c)-I*Pi*b^2*d^2*n*x*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b^2*d^2*
n*x*csgn(I*c*x^n)^2*csgn(I*c)+1/2*b^2*d*e*n^2*x^2+I*Pi*b^2*d^2*n*x*csgn(I*x
```

```
^n)*csgn(I*c*x^n)*csgn(I*c)+I*e*ln(c)*Pi*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n
)^2+I*e*ln(c)*Pi*b^2*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)+I*e*Pi*a*b*d*x^2*csgn(
I*x^n)*csgn(I*c*x^n)^2+I*e*Pi*a*b*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)-I*ln(c)*P
i*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-I*Pi*a*b*d^2*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*x-1/3*I*e^2*ln(c)*Pi*b^2*x^3*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)+1/9*I*e^2*Pi*b^2*n*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*
I*e*Pi*b^2*d*n*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/3*I*e^2*Pi*a*b*x^3*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*e*Pi*b^2*d*n*x^2*csgn(I*c*x^n)^2*csgn(I*
c)
```

maxima [A] time = 0.59, size = 235, normalized size = 1.36

$$\frac{1}{3}b^2e^2x^3\log(cx^n)^2-\frac{2}{9}abe^2nx^3+\frac{2}{3}abe^2x^3\log(cx^n)+b^2dex^2\log(cx^n)^2-abdenx^2+\frac{1}{3}a^2e^2x^3+2abdex^2\log(cx^n)+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] 1/3*b^2*e^2*x^3*log(c*x^n)^2 - 2/9*a*b*e^2*n*x^3 + 2/3*a*b*e^2*x^3*log(c*x^
n) + b^2*d*e*x^2*log(c*x^n)^2 - a*b*d*e*n*x^2 + 1/3*a^2*e^2*x^3 + 2*a*b*d*e
*x^2*log(c*x^n) + b^2*d^2*x*log(c*x^n)^2 - 2*a*b*d^2*n*x + a^2*d*e*x^2 + 2*
a*b*d^2*x*log(c*x^n) + 2*(n^2*x - n*x*log(c*x^n))*b^2*d^2 + 1/2*(n^2*x^2 -
2*n*x^2*log(c*x^n))*b^2*d*e + 2/27*(n^2*x^3 - 3*n*x^3*log(c*x^n))*b^2*e^2 +
 a^2*d^2*x
```

mupad [B] time = 3.49, size = 166, normalized size = 0.96

$$\ln(c\,x^n)^2\,\left(b^2\,d^2\,x+b^2\,d\,e\,x^2+\frac{b^2\,e^2\,x^3}{3}\right)+\ln(c\,x^n)\,\left(2\,b\,\left(a-b\,n\right)\,d^2\,x+b\,\left(2\,a-b\,n\right)\,d\,e\,x^2+\frac{2\,b\,\left(3\,a-b\,n\right)\,e^2\,x}{9}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2*(d + e*x)^2,x)
```

```
[Out] log(c*x^n)^2*(b^2*d^2*x + (b^2*e^2*x^3)/3 + b^2*d*e*x^2) + log(c*x^n)*((2*b
*e^2*x^3*(3*a - b*n))/9 + 2*b*d^2*x*(a - b*n) + b*d*e*x^2*(2*a - b*n)) + d^
2*x*(a^2 + 2*b^2*n^2 - 2*a*b*n) + (e^2*x^3*(9*a^2 + 2*b^2*n^2 - 6*a*b*n))/2
7 + (d*e*x^2*(2*a^2 + b^2*n^2 - 2*a*b*n))/2
```

sympy [B] time = 2.18, size = 478, normalized size = 2.76

$$a^2d^2x+a^2dex^2+\frac{a^2e^2x^3}{3}+2abd^2nx\log(x)-2abd^2nx+2abd^2x\log(c)+2abdenx^2\log(x)-abdenx^2+2abdex^2\log(c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))**2,x)
```

```
[Out] a**2*d**2*x + a**2*d*e*x**2 + a**2*e**2*x**3/3 + 2*a*b*d**2*n*x*log(x) - 2*
a*b*d**2*n*x + 2*a*b*d**2*x*log(c) + 2*a*b*d*e*n*x**2*log(x) - a*b*d*e*n*x*
*2 + 2*a*b*d*e*x**2*log(c) + 2*a*b*e**2*n*x**3*log(x)/3 - 2*a*b*e**2*n*x**3
/9 + 2*a*b*e**2*x**3*log(c)/3 + b**2*d**2*n**2*x*log(x)**2 - 2*b**2*d**2*n*
*2*x*log(x) + 2*b**2*d**2*n**2*x + 2*b**2*d**2*n*x*log(c)*log(x) - 2*b**2*d
**2*n*x*log(c) + b**2*d**2*x*log(c)**2 + b**2*d*e*n**2*x**2*log(x)**2 - b**
2*d*e*n**2*x**2*log(x) + b**2*d*e*n**2*x**2/2 + 2*b**2*d*e*n*x**2*log(c)*lo
g(x) - b**2*d*e*n*x**2*log(c) + b**2*d*e*x**2*log(c)**2 + b**2*e**2*n**2*x*
*3*log(x)**2/3 - 2*b**2*e**2*n**2*x**3*log(x)/9 + 2*b**2*e**2*n**2*x**3/27
+ 2*b**2*e**2*n*x**3*log(c)*log(x)/3 - 2*b**2*e**2*n*x**3*log(c)/9 + b**2*e
**2*x**3*log(c)**2/3
```

3.87 $\int \frac{(d+ex)^2\left(a+b\log(cx^n)\right)^2}{x}\,dx$

Optimal. Leaf size=137

$$\frac{d^2\left(a+b\log\left(cx^n\right)\right)^3}{3bn}+2dex\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{2}e^2x^2\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{2}be^2nx^2\left(a+b\log\left(cx^n\right)\right)-4abdenx-4b^2c$$

```
[Out] -4*a*b*d*e*n*x+4*b^2*d*e*n^2*x+1/4*b^2*e^2*n^2*x^2-4*b^2*d*e*n*x*ln(c*x^n)-
1/2*b*e^2*n*x^2*(a+b*ln(c*x^n))+2*d*e*x*(a+b*ln(c*x^n))^2+1/2*e^2*x^2*(a+b*
ln(c*x^n))^2+1/3*d^2*(a+b*ln(c*x^n))^3/b/n
```

Rubi [A] time = 0.23, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2346, 2302, 30, 2296, 2295, 2330, 2305, 2304}

$$\frac{d^2\left(a+b\log\left(cx^n\right)\right)^3}{3bn}+2dex\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{2}e^2x^2\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{2}be^2nx^2\left(a+b\log\left(cx^n\right)\right)-4abdenx-4b^2c$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] -4*a*b*d*e*n*x + 4*b^2*d*e*n^2*x + (b^2*e^2*n^2*x^2)/4 - 4*b^2*d*e*n*x*Log[
c*x^n] - (b*e^2*n*x^2*(a + b*Log[c*x^n]))/2 + 2*d*e*x*(a + b*Log[c*x^n])^2
+ (e^2*x^2*(a + b*Log[c*x^n])^2)/2 + (d^2*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
```

```
c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2346

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[((d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p)/x,
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx &= d\int \frac{(d+ex)\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx + e\int (d+ex)\left(a+b\log\left(cx^n\right)\right)^2\,dx\\ &= d^2\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx + e\int \left(d\left(a+b\log\left(cx^n\right)\right)^2 + ex\left(a+b\log\left(cx^n\right.\right.\right.\\ &= dex\left(a+b\log\left(cx^n\right)\right)^2 + (de)\int \left(a+b\log\left(cx^n\right)\right)^2\,dx + e^2\int x\left(a+b\log\left(\right.\right.\\ &= -2abdenx + 2dex\left(a+b\log\left(cx^n\right)\right)^2 + \frac{1}{2}e^2x^2\left(a+b\log\left(cx^n\right)\right)^2 + \frac{d^2\left(a+b\right.}{\;}\\ &= -4abdenx + 2b^2den^2x + \frac{1}{4}b^2e^2n^2x^2 - 2b^2denx\log\left(cx^n\right) - \frac{1}{2}be^2nx^2\left(a+b\right.\\ &= -4abdenx + 4b^2den^2x + \frac{1}{4}b^2e^2n^2x^2 - 4b^2denx\log\left(cx^n\right) - \frac{1}{2}be^2nx^2\left(a+b\right.\end{aligned}$$

Mathematica [A] time = 0.04, size = 114, normalized size = 0.83

$$\frac{d^2\left(a+b\log\left(cx^n\right)\right)^3}{3bn}+2dex\left(a+b\log\left(cx^n\right)\right)^2-4bdenx\left(a+b\log\left(cx^n\right)-bn\right)+\frac{1}{2}e^2x^2\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{4}be^2nx$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (b*e^2*n*x^2*(-2*a + b*n - 2*b*Log[c*x^n]))/4 + 2*d*e*x*(a + b*Log[c*x^n])^
2 + (e^2*x^2*(a + b*Log[c*x^n])^2)/2 + (d^2*(a + b*Log[c*x^n])^3)/(3*b*n) -
 4*b*d*e*n*x*(a - b*n + b*Log[c*x^n])
```

fricas [B] time = 0.70, size = 293, normalized size = 2.14

$$\frac{1}{3}b^2d^2n^2\log(x)^3+\frac{1}{4}\left(b^2e^2n^2-2abe^2n+2a^2e^2\right)x^2+\frac{1}{2}\left(b^2e^2x^2+4b^2dex\right)\log(c)^2+\frac{1}{2}\left(b^2e^2n^2x^2+4b^2den^2x+2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x,x, algorithm="fricas")
```

```
[Out] 1/3*b^2*d^2*n^2*log(x)^3 + 1/4*(b^2*e^2*n^2 - 2*a*b*e^2*n + 2*a^2*e^2)*x^2
+ 1/2*(b^2*e^2*x^2 + 4*b^2*d*e*x)*log(c)^2 + 1/2*(b^2*e^2*n^2*x^2 + 4*b^2*d
```

```
*e*n^2*x + 2*b^2*d^2*n*log(c) + 2*a*b*d^2*n)*log(x)^2 + 2*(2*b^2*d*e*n^2 -
2*a*b*d*e*n + a^2*d*e)*x - 1/2*((b^2*e^2*n - 2*a*b*e^2)*x^2 + 8*(b^2*d*e*n
- a*b*d*e)*x)*log(c) + 1/2*(2*b^2*d^2*log(c)^2 + 2*a^2*d^2 - (b^2*e^2*n^2 -
 2*a*b*e^2*n)*x^2 - 8*(b^2*d*e*n^2 - a*b*d*e*n)*x + 2*(b^2*e^2*n*x^2 + 4*b^
2*d*e*n*x + 2*a*b*d^2)*log(c))*log(x)
```

giac [B] time = 0.34, size = 321, normalized size = 2.34

$$\frac{1}{2}b^2n^2x^2e^2\log(x)^2+2b^2dn^2xe\log(x)^2+\frac{1}{3}b^2d^2n^2\log(x)^3-\frac{1}{2}b^2n^2x^2e^2\log(x)-4b^2dn^2xe\log(x)+b^2nx^2e^2\log(c)\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x,x, algorithm="giac")
```

```
[Out] 1/2*b^2*n^2*x^2*e^2*log(x)^2 + 2*b^2*d*n^2*x*e*log(x)^2 + 1/3*b^2*d^2*n^2*l
og(x)^3 - 1/2*b^2*n^2*x^2*e^2*log(x) - 4*b^2*d*n^2*x*e*log(x) + b^2*n*x^2*e
^2*log(c)*log(x) + 4*b^2*d*n*x*e*log(c)*log(x) + b^2*d^2*n*log(c)*log(x)^2
+ 1/4*b^2*n^2*x^2*e^2 + 4*b^2*d*n^2*x*e - 1/2*b^2*n*x^2*e^2*log(c) - 4*b^2*
d*n*x*e*log(c) + 1/2*b^2*x^2*e^2*log(c)^2 + 2*b^2*d*x*e*log(c)^2 + a*b*n*x^
2*e^2*log(x) + 4*a*b*d*n*x*e*log(x) + b^2*d^2*log(c)^2*log(x) + a*b*d^2*n*l
og(x)^2 - 1/2*a*b*n*x^2*e^2 - 4*a*b*d*n*x*e + a*b*x^2*e^2*log(c) + 4*a*b*d*
x*e*log(c) + 2*a*b*d^2*log(c)*log(x) + 1/2*a^2*x^2*e^2 + 2*a^2*d*x*e + a^2*
d^2*log(x)
```

maple [C] time = 0.51, size = 2543, normalized size = 18.56

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(b*ln(c*x^n)+a)^2/x,x)
```

```
[Out] ln(x)*ln(c)^2*b^2*d^2+1/2*ln(c)^2*b^2*e^2*x^2+1/3*b^2*d^2*n^2*ln(x)^3+(1/2*
b^2*e^2*x^2+2*b^2*d*e*x+b^2*d^2*ln(x))*ln(x^n)^2+(-b^2*d^2*n*ln(x)^2+1/2*I*
Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*ln(x)*b^2*d^2*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)+I*Pi*ln(x)*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*ln(x
)*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3-
2*I*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*b^2*e^2*x^2*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b^2*d*e*x*csgn(I*c*x^n)^3+ln(c)*b
^2*e^2*x^2-1/2*b^2*e^2*n*x^2+4*ln(c)*b^2*d*e*x+a*b*e^2*x^2-4*b^2*d*e*n*x+4*
a*b*d*e*x+2*I*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*ln(x)*b^2*d^2*csg
n(I*c*x^n)^3+1/2*I*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi*b^2*d*
e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+2*ln(c)*ln(x)*b^2*d^2+2*ln(x)*a*b*d^2)*ln(x
^n)+ln(x)*a^2*d^2+2*a^2*d*e*x-1/2*I*Pi*a*b*e^2*x^2*csgn(I*c*x^n)^3-I*ln(x)*
Pi*ln(c)*b^2*d^2*csgn(I*c*x^n)^3-I*ln(x)*Pi*a*b*d^2*csgn(I*c*x^n)^3+1/2*I*P
i*b^2*d^2*n*csgn(I*c*x^n)^3*ln(x)^2+1/2*a^2*e^2*x^2-1/2*b*n*a*e^2*x^2+2*ln(
x)*ln(c)*a*b*d^2+2*ln(c)^2*b^2*d*e*x+ln(c)*a*b*e^2*x^2-1/2*n*ln(c)*b^2*e^2*
x^2-a*b*d^2*n*ln(x)^2-ln(c)*b^2*d^2*n*ln(x)^2+1/2*I*Pi*ln(c)*b^2*e^2*x^2*cs
gn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*Pi*ln(c)*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I
*c)-2*I*Pi*ln(c)*b^2*d*e*x*csgn(I*c*x^n)^3+1/2*I*Pi*a*b*e^2*x^2*csgn(I*x^n)
*csgn(I*c*x^n)^2-1/2*I*Pi*b^2*d^2*n*csgn(I*c*x^n)^2*csgn(I*c)*ln(x)^2-I*ln(
x)*Pi*ln(c)*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*ln(x)*Pi*a*b*d^2*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)-2*I*Pi*ln(c)*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*
I*n*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*Pi^2*b^2*e^2*x^2*c
sgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+1/2*ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)*c
sgn(I*c*x^n)^5+1/2*ln(x)*Pi^2*b^2*d^2*csgn(I*c*x^n)^5*csgn(I*c)-1/4*ln(x)*P
i^2*b^2*d^2*csgn(I*c*x^n)^4*csgn(I*c)^2-1/2*Pi^2*b^2*d*e*x*csgn(I*x^n)^2*cs
gn(I*c*x^n)^4+Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5+I*ln(x)*Pi*a*b*d^2
*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*b^2*e^2*n^2*x^2-1/8*Pi^2*b^2*e^2*x^2*csgn(
I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/2*Pi^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(
```

```
I*c*x^n)^4*csgn(I*c)+1/4*Pi^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(
I*c)^2+Pi^2*b^2*d*e*x*csgn(I*c*x^n)^5*csgn(I*c)-1/2*Pi^2*b^2*d*e*x*csgn(I*c
*x^n)^4*csgn(I*c)^2+1/2*ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*cs
gn(I*c)-1/4*ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/
4*ln(x)*Pi^2*b^2*d^2*csgn(I*c*x^n)^6-1/8*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^6-4
*a*b*d*e*n*x+2*I*Pi*a*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*Pi*ln(c)*b^2*
e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*Pi*b^2*d^2*n*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)*ln(x)^2+2*I*Pi*ln(c)*b^2*d*e*x*csgn(I*x^n)*csgn(I*c
*x^n)^2+2*I*Pi*ln(c)*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*n*Pi*b^2*e^2
*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*Pi*a*b*e^2*x^2*csgn(I*c*x^n)
^2*csgn(I*c)-2*I*Pi*a*b*d*e*x*csgn(I*c*x^n)^3-1/4*I*n*Pi*b^2*e^2*x^2*csgn(I
*x^n)*csgn(I*c*x^n)^2+Pi^2*b^2*d*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c
)-1/2*Pi^2*b^2*d*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+4*b^2*d*e*n^
2*x-1/2*I*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)^2*ln(x)^2+I*ln(x)*Pi*a*b*d
^2*csgn(I*c*x^n)^2*csgn(I*c)+I*ln(x)*Pi*ln(c)*b^2*d^2*csgn(I*x^n)*csgn(I*c*
x^n)^2+I*ln(x)*Pi*ln(c)*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)-1/8*Pi^2*b^2*e^2*
x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/4*Pi^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c
*x^n)^5+1/4*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^5*csgn(I*c)-1/8*Pi^2*b^2*e^2*x^2
*csgn(I*c*x^n)^4*csgn(I*c)^2-1/2*Pi^2*b^2*d*e*x*csgn(I*c*x^n)^6-1/4*ln(x)*P
i^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4-2*I*n*Pi*b^2*d*e*x*csgn(I*c*x^n)^
2*csgn(I*c)-2*I*n*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*Pi*a*b*e^2
*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(
I*c*x^n)^2+4*ln(c)*a*b*d*e*x-4*n*ln(c)*b^2*d*e*x-2*Pi^2*b^2*d*e*x*csgn(I*x^
n)*csgn(I*c*x^n)^4*csgn(I*c)+Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^3*csg
n(I*c)^2-1/4*I*n*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+2*I*n*Pi*b^2*d*e*
x*csgn(I*c*x^n)^3-ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+
1/2*ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/4*I*n*Pi*b
^2*e^2*x^2*csgn(I*c*x^n)^3-1/2*I*Pi*ln(c)*b^2*e^2*x^2*csgn(I*c*x^n)^3
```

maxima [A] time = 0.59, size = 198, normalized size = 1.45

$$\frac{1}{2}\,b^2e^2x^2\log\left(cx^n\right)^2-\frac{1}{2}\,abe^2nx^2+abe^2x^2\log\left(cx^n\right)+2\,b^2dex\log\left(cx^n\right)^2-4\,abdenx+\frac{1}{2}\,a^2e^2x^2+4\,abdex\log\left(cx^n\right)+\frac{b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x,x, algorithm="maxima")
```

```
[Out] 1/2*b^2*e^2*x^2*log(c*x^n)^2 - 1/2*a*b*e^2*n*x^2 + a*b*e^2*x^2*log(c*x^n) +
 2*b^2*d*e*x*log(c*x^n)^2 - 4*a*b*d*e*n*x + 1/2*a^2*e^2*x^2 + 4*a*b*d*e*x*l
og(c*x^n) + 1/3*b^2*d^2*log(c*x^n)^3/n + 4*(n^2*x - n*x*log(c*x^n))*b^2*d*e
 + 1/4*(n^2*x^2 - 2*n*x^2*log(c*x^n))*b^2*e^2 + 2*a^2*d*e*x + a*b*d^2*log(c
*x^n)^2/n + a^2*d^2*log(x)
```

mupad [B] time = 3.78, size = 152, normalized size = 1.11

$$\ln\left(c\,x^n\right)^2\,\left(\frac{b^2\,e^2\,x^2}{2}+2\,b^2\,d\,e\,x+\frac{a\,b\,d^2}{n}\right)+\ln\left(c\,x^n\right)\,\left(\frac{b\,\left(2\,a-b\,n\right)\,e^2\,x^2}{2}+4\,b\,d\,\left(a-b\,n\right)\,e\,x\right)+a^2\,d^2\,\ln(x)+\frac{e^2\,x^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))^2*(d + e*x)^2)/x,x)
```

```
[Out] log(c*x^n)^2*((b^2*e^2*x^2)/2 + 2*b^2*d*e*x + (a*b*d^2)/n) + log(c*x^n)*((b
*e^2*x^2*(2*a - b*n))/2 + 4*b*d*e*x*(a - b*n)) + a^2*d^2*log(x) + (e^2*x^2*
(2*a^2 + b^2*n^2 - 2*a*b*n))/4 + 2*d*e*x*(a^2 + 2*b^2*n^2 - 2*a*b*n) + (b^2
*d^2*log(c*x^n)^3)/(3*n)
```

sympy [B] time = 2.11, size = 398, normalized size = 2.91

$$a^2d^2\log\left(x\right)+2a^2dex+\frac{a^2e^2x^2}{2}+abd^2n\log\left(x\right)^2+2abd^2\log\left(c\right)\log\left(x\right)+4abdenx\log\left(x\right)-4abdenx+4abdex\log\left(c\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))**2/x,x)
```

```
[Out] a**2*d**2*log(x) + 2*a**2*d*e*x + a**2*e**2*x**2/2 + a*b*d**2*n*log(x)**2 +
 2*a*b*d**2*log(c)*log(x) + 4*a*b*d*e*n*x*log(x) - 4*a*b*d*e*n*x + 4*a*b*d*
e*x*log(c) + a*b*e**2*n*x**2*log(x) - a*b*e**2*n*x**2/2 + a*b*e**2*x**2*log
(c) + b**2*d**2*n**2*log(x)**3/3 + b**2*d**2*n*log(c)*log(x)**2 + b**2*d**2
*log(c)**2*log(x) + 2*b**2*d*e*n**2*x*log(x)**2 - 4*b**2*d*e*n**2*x*log(x)
+ 4*b**2*d*e*n**2*x + 4*b**2*d*e*n*x*log(c)*log(x) - 4*b**2*d*e*n*x*log(c)
+ 2*b**2*d*e*x*log(c)**2 + b**2*e**2*n**2*x**2*log(x)**2/2 - b**2*e**2*n**2
*x**2*log(x)/2 + b**2*e**2*n**2*x**2/4 + b**2*e**2*n*x**2*log(c)*log(x) - b
**2*e**2*n*x**2*log(c)/2 + b**2*e**2*x**2*log(c)**2/2
```

3.88 $\int \frac{(d+ex)^2\left(a+b\log(cx^n)\right)^2}{x^2}\,dx$

Optimal. Leaf size=133

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{2bd^2n\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{2de\left(a+b\log\left(cx^n\right)\right)^3}{3bn}+e^2x\left(a+b\log\left(cx^n\right)\right)^2-2abe^2nx-2b^2e^2$$

```
[Out] -2*b^2*d^2*n^2/x-2*a*b*e^2*n*x+2*b^2*e^2*n^2*x-2*b^2*e^2*n*x*ln(c*x^n)-2*b*
d^2*n*(a+b*ln(c*x^n))/x-d^2*(a+b*ln(c*x^n))^2/x+e^2*x*(a+b*ln(c*x^n))^2+2/3
*d*e*(a+b*ln(c*x^n))^3/b/n
```

Rubi [A] time = 0.17, antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2353, 2296, 2295, 2305, 2304, 2302, 30}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{2bd^2n\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{2de\left(a+b\log\left(cx^n\right)\right)^3}{3bn}+e^2x\left(a+b\log\left(cx^n\right)\right)^2-2abe^2nx-2b^2e^2$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x^2,x]
```

```
[Out] (-2*b^2*d^2*n^2)/x - 2*a*b*e^2*n*x + 2*b^2*e^2*n^2*x - 2*b^2*e^2*n*x*Log[c*
x^n] - (2*b*d^2*n*(a + b*Log[c*x^n]))/x - (d^2*(a + b*Log[c*x^n])^2)/x + e^
2*x*(a + b*Log[c*x^n])^2 + (2*d*e*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
```

```
c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int \frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\,dx = \int \left(e^2\left(a+b\log\left(cx^n\right)\right)^2+\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{x^2}+\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x}\right)dx$$

$$= d^2\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\,dx+(2de)\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx+e^2\int \left(a+b\log\right.$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{x}+e^2x\left(a+b\log\left(cx^n\right)\right)^2+\frac{(2de)\,\mathrm{Subst}\left(\int x^2\,dx,x,a+\right.}{bn}$$

$$= -\frac{2b^2d^2n^2}{x}-2abe^2nx-\frac{2bd^2n\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{x}+e^2x$$

$$= -\frac{2b^2d^2n^2}{x}-2abe^2nx+2b^2e^2n^2x-2b^2e^2nx\log\left(cx^n\right)-\frac{2bd^2n\left(a+b\log\left(cx^n\right.\right.}{x}$$

Mathematica [A] time = 0.04, size = 107, normalized size = 0.80

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{2bd^2n\left(a+b\log\left(cx^n\right)+bn\right)}{x}+\frac{2de\left(a+b\log\left(cx^n\right)\right)^3}{3bn}+e^2x\left(a+b\log\left(cx^n\right)\right)^2-2be^2nx\left(a+\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x^2,x]
```

```
[Out] -((d^2*(a + b*Log[c*x^n])^2)/x) + e^2*x*(a + b*Log[c*x^n])^2 + (2*d*e*(a +
b*Log[c*x^n])^3)/(3*b*n) - 2*b*e^2*n*x*(a - b*n + b*Log[c*x^n]) - (2*b*d^2*
n*(a + b*n + b*Log[c*x^n]))/x
```

fricas [B] time = 0.61, size = 291, normalized size = 2.19

$$\frac{2\,b^2den^2x\log(x)^3-6\,b^2d^2n^2-6\,abd^2n-3\,a^2d^2+3\left(2\,b^2e^2n^2-2\,abe^2n+a^2e^2\right)x^2+3\left(b^2e^2x^2-b^2d^2\right)\log(c)^2+3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(2*b^2*d*e*n^2*x*log(x)^3 - 6*b^2*d^2*n^2 - 6*a*b*d^2*n - 3*a^2*d^2 + 3
*(2*b^2*e^2*n^2 - 2*a*b*e^2*n + a^2*e^2)*x^2 + 3*(b^2*e^2*x^2 - b^2*d^2)*lo
g(c)^2 + 3*(b^2*e^2*n^2*x^2 + 2*b^2*d*e*n*x*log(c) - b^2*d^2*n^2 + 2*a*b*d*
e*n*x)*log(x)^2 - 6*(b^2*d^2*n + a*b*d^2 + (b^2*e^2*n - a*b*e^2)*x^2)*log(c
) + 6*(b^2*d*e*x*log(c)^2 - b^2*d^2*n^2 - a*b*d^2*n + a^2*d*e*x - (b^2*e^2*
n^2 - a*b*e^2*n)*x^2 + (b^2*e^2*n*x^2 - b^2*d^2*n + 2*a*b*d*e*x)*log(c))*lo
g(x))/x
```

giac [B] time = 0.40, size = 329, normalized size = 2.47

$$\frac{2\,b^2dn^2xe\log(x)^3 + 3\,b^2n^2x^2e^2\log(x)^2 + 6\,b^2dnxe\log(c)\log(x)^2 - 6\,b^2n^2x^2e^2\log(x) + 6\,b^2nx^2e^2\log(c)\log(x)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^2,x, algorithm="giac")
```

```
[Out] 1/3*(2*b^2*d*n^2*x*e*log(x)^3 + 3*b^2*n^2*x^2*e^2*log(x)^2 + 6*b^2*d*n*x*e*
log(c)*log(x)^2 - 6*b^2*n^2*x^2*e^2*log(x) + 6*b^2*n*x^2*e^2*log(c)*log(x)
+ 6*b^2*d*x*e*log(c)^2*log(x) - 3*b^2*d^2*n^2*log(x)^2 + 6*a*b*d*n*x*e*log(
x)^2 + 6*b^2*n^2*x^2*e^2 - 6*b^2*n*x^2*e^2*log(c) + 3*b^2*x^2*e^2*log(c)^2
- 6*b^2*d^2*n^2*log(x) + 6*a*b*n*x^2*e^2*log(x) - 6*b^2*d^2*n*log(c)*log(x)
 + 12*a*b*d*x*e*log(c)*log(x) - 6*b^2*d^2*n^2 - 6*a*b*n*x^2*e^2 - 6*b^2*d^2
*n*log(c) + 6*a*b*x^2*e^2*log(c) - 3*b^2*d^2*log(c)^2 - 6*a*b*d^2*n*log(x)
+ 6*a^2*d*x*e*log(x) - 6*a*b*d^2*n + 3*a^2*x^2*e^2 - 6*a*b*d^2*log(c) - 3*a
^2*d^2)/x
```

maple [C] time = 0.56, size = 2521, normalized size = 18.95

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(b*ln(c*x^n)+a)^2/x^2,x)
```

```
[Out] -b^2*(-2*d*e*x*ln(x)-e^2*x^2+d^2)/x*ln(x^n)^2-b*(I*Pi*b*e^2*x^2*csgn(I*c*x^
n)^3+2*I*ln(x)*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+2*I*ln(x)*Pi*
b*d*e*csgn(I*c*x^n)^3*x-I*Pi*b*d^2*csgn(I*c*x^n)^3-I*Pi*b*e^2*x^2*csgn(I*x^
n)*csgn(I*c*x^n)^2+I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*e^2*x^2*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*ln(x)*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x
^n)^2*x+I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)-I*Pi*b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-2*I*ln(x)*Pi*b*d*
e*csgn(I*c*x^n)^2*csgn(I*c)*x+2*b*d*e*n*x*ln(x)^2-4*b*d*e*x*ln(c)*ln(x)-2*b
*e^2*x^2*ln(c)+2*b*e^2*n*x^2-4*a*d*e*x*ln(x)-2*a*e^2*x^2+2*b*d^2*ln(c)+2*b*
d^2*n+2*a*d^2)/x*ln(x^n)+1/12*(12*b^2*e^2*x^2*ln(c)^2-6*ln(x)*Pi^2*b^2*d*e*
csgn(I*x^n)^2*csgn(I*c*x^n)^4*x-12*a^2*d^2-12*ln(c)^2*b^2*d^2-24*b^2*d^2*n^
2+3*Pi^2*b^2*d^2*csgn(I*c*x^n)^6-24*ln(c)*a*b*d^2-24*ln(c)*b^2*d^2*n+12*a^2
*e^2*x^2-24*a*b*n*d^2-24*a*b*e^2*n*x^2+24*I*ln(x)*ln(c)*Pi*b^2*d*e*csgn(I*x
^n)*csgn(I*c*x^n)^2*x+24*I*ln(x)*ln(c)*Pi*b^2*d*e*csgn(I*c*x^n)^2*csgn(I*c)
*x+24*I*ln(x)*Pi*a*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x+24*ln(x)*a^2*d*e*x+2
4*a*b*e^2*x^2*ln(c)-24*b^2*e^2*n*x^2*ln(c)-24*I*ln(x)*ln(c)*Pi*b^2*d*e*csgn
(I*c*x^n)^3*x-24*I*ln(x)*Pi*a*b*d*e*csgn(I*c*x^n)^3*x+12*I*Pi*b^2*d*e*n*csg
n(I*c*x^n)^3*ln(x)^2*x+12*I*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)-24*I*ln(x)*ln(c)*Pi*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-12*
I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*a*b*d^2*csgn(I*c*x^n)^2*cs
gn(I*c)+12*I*Pi*ln(c)*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+12*I*Pi*a*b*e^2
*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+6*Pi^2*b^2*e^2*x^2*csgn(I*c)*csgn(I*x^n)^2
*csgn(I*c*x^n)^3+24*I*ln(x)*Pi*a*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x-12*I*Pi*
b^2*d*e*n*csgn(I*x^n)*csgn(I*c*x^n)^2*ln(x)^2*x+12*I*ln(c)*Pi*b^2*d^2*csgn(
I*c*x^n)^3+12*I*Pi*a*b*d^2*csgn(I*c*x^n)^3+12*I*Pi*b^2*d^2*n*csgn(I*c*x^n)^
3-6*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+48*ln(x)*ln(c)*a*b
*d*e*x-24*a*b*d*e*n*ln(x)^2*x-24*ln(c)*b^2*d*e*n*ln(x)^2*x-24*I*ln(x)*Pi*a*
b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+12*I*Pi*b^2*d*e*n*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*ln(x)^2*x+24*ln(x)*ln(c)^2*b^2*d*e*x+8*b^2*d*e*n^2*l
n(x)^3*x+24*b^2*e^2*n^2*x^2-12*I*Pi*a*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)-12*I*Pi*b^2*d*e*n*csgn(I*c*x^n)^2*csgn(I*c)*ln(x)^2*x-3*Pi^2*b^2*e
^2*x^2*csgn(I*c)^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2-12*Pi^2*b^2*e^2*x^2*csgn(I
*c)*csgn(I*x^n)*csgn(I*c*x^n)^4+6*Pi^2*b^2*e^2*x^2*csgn(I*c)^2*csgn(I*x^n)*
csgn(I*c*x^n)^3-12*I*Pi*ln(c)*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
```

```
c)+12*ln(x)*Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x-6*ln(x)*
Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x-24*ln(x)*Pi^2*b^2*
d*e*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*x+12*ln(x)*Pi^2*b^2*d*e*csgn(I*x^
n)*csgn(I*c*x^n)^3*csgn(I*c)^2*x-12*I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c
*x^n)^2-12*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)-12*I*Pi*b^2*d^2*n*c
sgn(I*x^n)*csgn(I*c*x^n)^2+12*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn
(I*c)-6*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+3*Pi^2*b^2*d^2
*csgn(I*x^n)^2*csgn(I*c*x^n)^4-6*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^5-6
*Pi^2*b^2*d^2*csgn(I*c*x^n)^5*csgn(I*c)+3*Pi^2*b^2*d^2*csgn(I*c*x^n)^4*csgn
(I*c)^2-3*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^6-6*ln(x)*Pi^2*b^2*d*e*csgn(I*c*x^
n)^6*x+12*I*n*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3-12*I*Pi*ln(c)*b^2*e^2*x^2*csgn
(I*c*x^n)^3-12*I*Pi*a*b*e^2*x^2*csgn(I*c*x^n)^3-12*I*Pi*b^2*d^2*n*csgn(I*c*
x^n)^2*csgn(I*c)+3*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-3
*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+6*Pi^2*b^2*e^2*x^2*csgn(I*x
^n)*csgn(I*c*x^n)^5+6*Pi^2*b^2*e^2*x^2*csgn(I*c)*csgn(I*c*x^n)^5-3*Pi^2*b^2
*e^2*x^2*csgn(I*c)^2*csgn(I*c*x^n)^4+12*ln(x)*Pi^2*b^2*d*e*csgn(I*x^n)*csgn
(I*c*x^n)^5*x+12*ln(x)*Pi^2*b^2*d*e*csgn(I*c*x^n)^5*csgn(I*c)*x-6*ln(x)*Pi^
2*b^2*d*e*csgn(I*c*x^n)^4*csgn(I*c)^2*x+12*I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+12*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+
12*I*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+12*I*Pi*a*b*e^2*x^2*c
sgn(I*c*x^n)^2*csgn(I*c)-12*I*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-
12*I*n*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+12*I*Pi*ln(c)*b^2*e^2*x^2*c
sgn(I*x^n)*csgn(I*c*x^n)^2)/x
```

maxima [A] time = 0.63, size = 200, normalized size = 1.50

$$b^2e^2x\log(cx^n)^2-2\,abe^2nx+2\,abe^2x\log(cx^n)+\frac{2\,b^2de\log(cx^n)^3}{3\,n}+2\left(n^2x-nx\log(cx^n)\right)b^2e^2-2\,b^2d^2\left(\frac{n^2}{x}+\frac{n\log(c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^2,x, algorithm="maxima")
```

```
[Out] b^2*e^2*x*log(c*x^n)^2 - 2*a*b*e^2*n*x + 2*a*b*e^2*x*log(c*x^n) + 2/3*b^2*d
*e*log(c*x^n)^3/n + 2*(n^2*x - n*x*log(c*x^n))*b^2*e^2 - 2*b^2*d^2*(n^2/x +
 n*log(c*x^n)/x) + a^2*e^2*x + 2*a*b*d*e*log(c*x^n)^2/n - b^2*d^2*log(c*x^n
)^2/x + 2*a^2*d*e*log(x) - 2*a*b*d^2*n/x - 2*a*b*d^2*log(c*x^n)/x - a^2*d^2
/x
```

mupad [B] time = 3.74, size = 228, normalized size = 1.71

$$\ln(x)\left(2\,d\,e\,a^2+4\,d\,e\,a\,b\,n+4\,d\,e\,b^2\,n^2\right)-\frac{a^2\,d^2+2\,a\,b\,d^2\,n+2\,b^2\,d^2\,n^2}{x}-\ln\left(c\,x^n\right)\left(\frac{2\,b\,\left(a+b\,n\right)\,d^2+4\,b\,\left(a+b\,n\right)}{x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))^2*(d + e*x)^2)/x^2,x)
```

```
[Out] log(x)*(2*a^2*d*e + 4*b^2*d*e*n^2 + 4*a*b*d*e*n) - (a^2*d^2 + 2*b^2*d^2*n^2
 + 2*a*b*d^2*n)/x - log(c*x^n)*((2*b*d^2*(a + b*n) + 2*b*e^2*x^2*(a - b*n)
+ 4*b*d*e*x*(a + b*n))/x - 4*b*e^2*x*(a - b*n)) + log(c*x^n)^2*(2*b^2*e^2*x
 - (b^2*d^2 + b^2*e^2*x^2 + 2*b^2*d*e*x)/x + (2*b*d*e*(a + b*n))/n) + e^2*x
*(a^2 + 2*b^2*n^2 - 2*a*b*n) + (2*b^2*d*e*log(c*x^n)^3)/(3*n)
```

sympy [B] time = 2.06, size = 384, normalized size = 2.89

$$-\frac{a^2d^2}{x}+2a^2de\log(x)+a^2e^2x-\frac{2abd^2n\log(x)}{x}-\frac{2abd^2n}{x}-\frac{2abd^2\log(c)}{x}+2abden\log(x)^2+4abde\log(c)\log(x)+2ab$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))**2/x**2,x)
```

```
[Out] -a**2*d**2/x + 2*a**2*d*e*log(x) + a**2*e**2*x - 2*a*b*d**2*n*log(x)/x - 2*
a*b*d**2*n/x - 2*a*b*d**2*log(c)/x + 2*a*b*d*e*n*log(x)**2 + 4*a*b*d*e*log(
c)*log(x) + 2*a*b*e**2*n*x*log(x) - 2*a*b*e**2*n*x + 2*a*b*e**2*x*log(c) -
b**2*d**2*n**2*log(x)**2/x - 2*b**2*d**2*n**2*log(x)/x - 2*b**2*d**2*n**2/x
 - 2*b**2*d**2*n*log(c)*log(x)/x - 2*b**2*d**2*n*log(c)/x - b**2*d**2*log(c
)**2/x + 2*b**2*d*e*n**2*log(x)**3/3 + 2*b**2*d*e*n*log(c)*log(x)**2 + 2*b*
*2*d*e*log(c)**2*log(x) + b**2*e**2*n**2*x*log(x)**2 - 2*b**2*e**2*n**2*x*l
og(x) + 2*b**2*e**2*n**2*x + 2*b**2*e**2*n*x*log(c)*log(x) - 2*b**2*e**2*n*
x*log(c) + b**2*e**2*x*log(c)**2
```

3.89 $\int \frac{(d+ex)^2(a+b\log(cx^n))^2}{x^3}\,dx$

Optimal. Leaf size=137

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{4bden\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^3}{3bn}$$

```
[Out] -1/4*b^2*d^2*n^2/x^2-4*b^2*d*e*n^2/x-1/2*b*d^2*n*(a+b*ln(c*x^n))/x^2-4*b*d*
e*n*(a+b*ln(c*x^n))/x-1/2*d^2*(a+b*ln(c*x^n))^2/x^2-2*d*e*(a+b*ln(c*x^n))^2
/x+1/3*e^2*(a+b*ln(c*x^n))^3/b/n
```

Rubi [A] time = 0.19, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2353, 2305, 2304, 2302, 30}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{4bden\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^3}{3bn}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x^3,x]
```

```
[Out] -(b^2*d^2*n^2)/(4*x^2) - (4*b^2*d*e*n^2)/x - (b*d^2*n*(a + b*Log[c*x^n]))/(
2*x^2) - (4*b*d*e*n*(a + b*Log[c*x^n]))/x - (d^2*(a + b*Log[c*x^n])^2)/(2*x
^2) - (2*d*e*(a + b*Log[c*x^n])^2)/x + (e^2*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int \frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)^2}{x^3}\,dx = \int \left(\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{x^3}+\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x^2}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{x}\right)$$

$$= d^2\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^3}\,dx+(2de)\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\,dx+e^2\int \frac{\left(a+b\right.}{}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x}+\frac{e^2\,\mathrm{Subst}\left(\int x^2\,dx,x,a+\right.}{bn}$$

$$= -\frac{b^2d^2n^2}{4x^2}-\frac{4b^2den^2}{x}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{4bden\left(a+b\log\left(cx^n\right)\right)}{x}-$$

Mathematica [A] time = 0.09, size = 117, normalized size = 0.85

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{bd^2n\left(2a+2b\log\left(cx^n\right)+bn\right)}{4x^2}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{4bden\left(a+b\log\left(cx^n\right)+bn\right)}{x}+$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x^3,x]
```

```
[Out] -1/2*(d^2*(a + b*Log[c*x^n])^2)/x^2 - (2*d*e*(a + b*Log[c*x^n])^2)/x + (e^2
*(a + b*Log[c*x^n])^3)/(3*b*n) - (4*b*d*e*n*(a + b*n + b*Log[c*x^n]))/x - (
b*d^2*n*(2*a + b*n + 2*b*Log[c*x^n]))/(4*x^2)
```

fricas [B] time = 0.61, size = 291, normalized size = 2.12

$$4\,b^2e^2n^2x^2\log(x)^3-3\,b^2d^2n^2-6\,abd^2n-6\,a^2d^2-6\left(4\,b^2dex+b^2d^2\right)\log(c)^2+6\left(2\,b^2e^2nx^2\log(c)-4\,b^2den^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^3,x, algorithm="fricas")
```

```
[Out] 1/12*(4*b^2*e^2*n^2*x^2*log(x)^3 - 3*b^2*d^2*n^2 - 6*a*b*d^2*n - 6*a^2*d^2
- 6*(4*b^2*d*e*x + b^2*d^2)*log(c)^2 + 6*(2*b^2*e^2*n*x^2*log(c) - 4*b^2*d*
e*n^2*x + 2*a*b*e^2*n*x^2 - b^2*d^2*n^2)*log(x)^2 - 24*(2*b^2*d*e*n^2 + 2*a
*b*d*e*n + a^2*d*e)*x - 6*(b^2*d^2*n + 2*a*b*d^2 + 8*(b^2*d*e*n + a*b*d*e)*
x)*log(c) + 6*(2*b^2*e^2*x^2*log(c)^2 - b^2*d^2*n^2 + 2*a^2*e^2*x^2 - 2*a*b
*d^2*n - 8*(b^2*d*e*n^2 + a*b*d*e*n)*x - 2*(4*b^2*d*e*n*x - 2*a*b*e^2*x^2 +
 b^2*d^2*n)*log(c))*log(x))/x^2
```

giac [B] time = 0.44, size = 325, normalized size = 2.37

$$4\,b^2n^2x^2e^2\log(x)^3-24\,b^2dn^2xe\log(x)^2+12\,b^2nx^2e^2\log(c)\log(x)^2-48\,b^2dn^2xe\log(x)-48\,b^2dnxe\log(c)\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^3,x, algorithm="giac")
```

```
[Out] 1/12*(4*b^2*n^2*x^2*e^2*log(x)^3 - 24*b^2*d*n^2*x*e*log(x)^2 + 12*b^2*n*x^2
*e^2*log(c)*log(x)^2 - 48*b^2*d*n^2*x*e*log(x) - 48*b^2*d*n*x*e*log(c)*log(
x) + 12*b^2*x^2*e^2*log(c)^2*log(x) - 6*b^2*d^2*n^2*log(x)^2 + 12*a*b*n*x^2
*e^2*log(x)^2 - 48*b^2*d*n^2*x*e - 48*b^2*d*n*x*e*log(c) - 24*b^2*d*x*e*log
(c)^2 - 6*b^2*d^2*n^2*log(x) - 48*a*b*d*n*x*e*log(x) - 12*b^2*d^2*n*log(c)*
log(x) + 24*a*b*x^2*e^2*log(c)*log(x) - 3*b^2*d^2*n^2 - 48*a*b*d*n*x*e - 6*
```

```
b^2*d^2*n*log(c) - 48*a*b*d*x*e*log(c) - 6*b^2*d^2*log(c)^2 - 12*a*b*d^2*n*
log(x) + 12*a^2*x^2*e^2*log(x) - 6*a*b*d^2*n - 24*a^2*d*x*e - 12*a*b*d^2*lo
g(c) - 6*a^2*d^2)/x^2
```

maple [C] time = 0.51, size = 2520, normalized size = 18.39

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(b*ln(c*x^n)+a)^2/x^3,x)
```

```
[Out] -1/2*b^2*(-2*e^2*x^2*ln(x)+4*d*e*x+d^2)/x^2*ln(x^n)^2-1/2*b*(-2*I*ln(x)*Pi*
b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*x^2-2*I*ln(x)*Pi*b*e^2*csgn(I*x^n)*csgn(I*c
*x^n)^2*x^2-4*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*Pi*b*d*e
*x*csgn(I*c*x^n)^3+4*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d^2*csgn
(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+2*I*ln(x)*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)*x^2+2*I*ln(x)*Pi*b*e^2*csgn(I*c*x^n)^3*x^2+I*Pi*b*d^2*csgn(I*x^
n)*csgn(I*c*x^n)^2-I*Pi*b*d^2*csgn(I*c*x^n)^3+I*Pi*b*d^2*csgn(I*c)*csgn(I*c
*x^n)^2+4*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+2*b*e^2*n*x^2*ln(x)^2-4*
b*e^2*x^2*ln(c)*ln(x)-4*a*e^2*x^2*ln(x)+8*b*d*e*x*ln(c)+8*b*d*e*n*x+2*b*d^2
*ln(c)+8*a*d*e*x+b*d^2*n+2*a*d^2)/x^2*ln(x^n)+1/24*(-12*a^2*d^2-12*b^2*d^2*
ln(c)^2+24*ln(x)*a^2*e^2*x^2-6*b^2*d^2*n^2-48*a^2*d*e*x+3*Pi^2*b^2*d^2*csgn
(I*c*x^n)^6-24*a*b*d^2*ln(c)-12*b^2*d^2*n*ln(c)-12*a*b*d^2*n-6*ln(x)*Pi^2*b
^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4*x^2+12*ln(x)*Pi^2*b^2*e^2*csgn(I*x^n)*
csgn(I*c*x^n)^5*x^2+12*ln(x)*Pi^2*b^2*e^2*csgn(I*c*x^n)^5*csgn(I*c)*x^2-48*
b^2*d*e*x*ln(c)^2-48*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-48*I*Pi*a*b
*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+12*I*ln(x)^2*Pi*b^2*e^2*n*csgn(I*c*x^n)^3*
x^2+6*I*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+48*I*Pi*a*b*d*e*x*
csgn(I*c*x^n)^3+48*I*Pi*ln(c)*b^2*d*e*x*csgn(I*c*x^n)^3-12*I*Pi*a*b*d^2*csg
n(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*a*b*d^2*csgn(I*c)*csgn(I*c*x^n)^2-24*I*ln(
x)*ln(c)*Pi*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2-24*I*ln(x)*Pi*a
*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2+12*I*ln(x)^2*Pi*b^2*e^2*n*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2+48*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)+12*I*Pi*b^2*d^2*csgn(I*c*x^n)^3*ln(c)+12*I*Pi*a*b*d^2*csgn
(I*c*x^n)^3-6*Pi^2*b^2*d^2*csgn(I*c)*csgn(I*x^n)^2*csgn(I*c*x^n)^3+12*ln(x)
*Pi^2*b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x^2-6*ln(x)*Pi^2*b^2*
e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x^2+48*I*Pi*b^2*d*e*n*x*csgn(
I*c*x^n)^3-24*I*ln(x)*ln(c)*Pi*b^2*e^2*csgn(I*c*x^n)^3*x^2-24*I*ln(x)*Pi*a*
b*e^2*csgn(I*c*x^n)^3*x^2-6*I*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)^2-6*I*
Pi*b^2*d^2*n*csgn(I*c*x^n)^2*csgn(I*c)-6*ln(x)*Pi^2*b^2*e^2*csgn(I*c*x^n)^4
*csgn(I*c)^2*x^2+24*ln(x)*ln(c)^2*b^2*e^2*x^2+8*b^2*e^2*n^2*ln(x)^3*x^2+12*
Pi^2*b^2*d*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^4-24*Pi^2*b^2*d*e*x*csgn(I*x^n)*
csgn(I*c*x^n)^5+24*I*ln(x)*ln(c)*Pi*b^2*e^2*csgn(I*c*x^n)^2*csgn(I*c)*x^2+2
4*I*ln(x)*Pi*a*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^2+24*I*ln(x)*Pi*a*b*e^2*
csgn(I*c*x^n)^2*csgn(I*c)*x^2-12*I*ln(x)^2*Pi*b^2*e^2*n*csgn(I*x^n)*csgn(I*
c*x^n)^2*x^2+48*ln(x)*ln(c)*a*b*e^2*x^2-24*ln(x)^2*ln(c)*b^2*e^2*n*x^2-24*l
n(x)^2*a*b*n*e^2*x^2+48*I*Pi*ln(c)*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)+48*I*Pi*b^2*d*e*n*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-12*I*Pi*b^2*d
^2*csgn(I*x^n)*csgn(I*c*x^n)^2*ln(c)-12*I*Pi*b^2*d^2*csgn(I*c)*csgn(I*c*x^n
)^2*ln(c)-24*Pi^2*b^2*d*e*x*csgn(I*c)*csgn(I*c*x^n)^5+12*Pi^2*b^2*d*e*x*csg
n(I*c)^2*csgn(I*c*x^n)^4+12*Pi^2*b^2*d^2*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n
)^4-6*Pi^2*b^2*d^2*csgn(I*c)^2*csgn(I*x^n)*csgn(I*c*x^n)^3+3*Pi^2*b^2*d^2*c
sgn(I*x^n)^2*csgn(I*c*x^n)^4-6*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^5-6*P
i^2*b^2*d^2*csgn(I*c)*csgn(I*c*x^n)^5+3*Pi^2*b^2*d^2*csgn(I*c)^2*csgn(I*c*x
^n)^4-96*a*b*d*e*n*x-48*I*ln(c)*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-48
*I*ln(c)*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-48*I*Pi*b^2*d*e*n*x*csgn(I*
x^n)*csgn(I*c*x^n)^2+24*I*ln(x)*ln(c)*Pi*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)^
2*x^2+3*Pi^2*b^2*d^2*csgn(I*c)^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2-24*ln(x)*Pi^
2*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*x^2+12*ln(x)*Pi^2*b^2*e^2*c
sgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*x^2-6*ln(x)*Pi^2*b^2*e^2*csgn(I*c*x^
```

```
n)^6*x^2-12*I*ln(x)^2*Pi*b^2*e^2*n*csgn(I*c*x^n)^2*csgn(I*c)*x^2-48*I*n*Pi*
b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-24*Pi^2*b^2*d*e*x*csgn(I*c)*csgn(I*x^n)
^2*csgn(I*c*x^n)^3+12*Pi^2*b^2*d*e*x*csgn(I*c)^2*csgn(I*x^n)^2*csgn(I*c*x^n
)^2-96*b^2*d*e*n^2*x+12*Pi^2*b^2*d*e*x*csgn(I*c*x^n)^6-96*a*b*d*e*x*ln(c)-9
6*b^2*d*e*n*x*ln(c)+48*Pi^2*b^2*d*e*x*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)^4
-24*Pi^2*b^2*d*e*x*csgn(I*c)^2*csgn(I*x^n)*csgn(I*c*x^n)^3+12*I*Pi*b^2*d^2*
csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)*ln(c)+12*I*Pi*a*b*d^2*csgn(I*c)*csgn(I*
x^n)*csgn(I*c*x^n)+6*I*Pi*b^2*d^2*n*csgn(I*c*x^n)^3)/x^2
```

maxima [A] time = 0.69, size = 210, normalized size = 1.53

$$\frac{b^2e^2\log(cx^n)^3}{3n} - 4\,b^2de\left(\frac{n^2}{x} + \frac{n\log(cx^n)}{x}\right) - \frac{1}{4}\,b^2d^2\left(\frac{n^2}{x^2} + \frac{2\,n\log(cx^n)}{x^2}\right) + \frac{abe^2\log(cx^n)^2}{n} - \frac{2\,b^2de\log(cx^n)^2}{x} + a^2\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^3,x, algorithm="maxima")
```

```
[Out] 1/3*b^2*e^2*log(c*x^n)^3/n - 4*b^2*d*e*(n^2/x + n*log(c*x^n)/x) - 1/4*b^2*d
^2*(n^2/x^2 + 2*n*log(c*x^n)/x^2) + a*b*e^2*log(c*x^n)^2/n - 2*b^2*d*e*log(
c*x^n)^2/x + a^2*e^2*log(x) - 4*a*b*d*e*n/x - 4*a*b*d*e*log(c*x^n)/x - 1/2*
b^2*d^2*log(c*x^n)^2/x^2 - 1/2*a*b*d^2*n/x^2 - 2*a^2*d*e/x - a*b*d^2*log(c*
x^n)/x^2 - 1/2*a^2*d^2/x^2
```

mupad [B] time = 3.77, size = 221, normalized size = 1.61

$$\ln(x)\left(a^2\,e^2 + 3\,a\,b\,e^2\,n + \frac{9\,b^2\,e^2\,n^2}{2}\right) - \frac{x\,\left(4\,d\,e\,a^2 + 8\,d\,e\,a\,b\,n + 8\,d\,e\,b^2\,n^2\right) + a^2\,d^2 + \frac{b^2\,d^2\,n^2}{2} + a\,b\,d^2\,n}{2\,x^2} - \ln(c\,x^n\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))^2*(d + e*x)^2)/x^3,x)
```

```
[Out] log(x)*(a^2*e^2 + (9*b^2*e^2*n^2)/2 + 3*a*b*e^2*n) - (x*(4*a^2*d*e + 8*b^2*
d*e*n^2 + 8*a*b*d*e*n) + a^2*d^2 + (b^2*d^2*n^2)/2 + a*b*d^2*n)/(2*x^2) - l
og(c*x^n)^2*(((b^2*d^2)/2 + (3*b^2*e^2*x^2)/2 + 2*b^2*d*e*x)/x^2 - (b*e^2*(
2*a + 3*b*n))/(2*n)) - (log(c*x^n)*((b*d^2*(2*a + b*n))/2 + (3*b*e^2*x^2*(2
*a + 3*b*n))/2 + 4*b*d*e*x*(a + b*n)))/x^2 + (b^2*e^2*log(c*x^n)^3)/(3*n)
```

sympy [A] time = 9.29, size = 357, normalized size = 2.61

$$-\frac{a^2d^2}{2x^2} - \frac{2a^2de}{x} + a^2e^2\log(x) - \frac{abd^2n}{2x^2} - \frac{abd^2\log(cx^n)}{x^2} - \frac{4abden}{x} - \frac{4abde\log(cx^n)}{x} - 2abe^2\left(\begin{cases} -\log(c)\log(x) & \text{for } \ldots \\ -\frac{\log(cx^n)^2}{2n} & \text{othe}\ldots \end{cases}\right.\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))**2/x**3,x)
```

```
[Out] -a**2*d**2/(2*x**2) - 2*a**2*d*e/x + a**2*e**2*log(x) - a*b*d**2*n/(2*x**2)
 - a*b*d**2*log(c*x**n)/x**2 - 4*a*b*d*e*n/x - 4*a*b*d*e*log(c*x**n)/x - 2*
a*b*e**2*Piecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True
)) - b**2*d**2*n**2*log(x)**2/(2*x**2) - b**2*d**2*n**2*log(x)/(2*x**2) - b
**2*d**2*n**2/(4*x**2) - b**2*d**2*n*log(c)*log(x)/x**2 - b**2*d**2*n*log(c
)/(2*x**2) - b**2*d**2*log(c)**2/(2*x**2) - 2*b**2*d*e*n**2*log(x)**2/x - 4
*b**2*d*e*n**2*log(x)/x - 4*b**2*d*e*n**2/x - 4*b**2*d*e*n*log(c)*log(x)/x
- 4*b**2*d*e*n*log(c)/x - 2*b**2*d*e*log(c)**2/x - b**2*e**2*Piecewise((-lo
g(c)**2*log(x), Eq(n, 0)), (-log(c*x**n)**3/(3*n), True))
```

3.90 $\int \frac{(d+ex)^2\left(a+b\log(cx^n)\right)^2}{x^4}\,dx$

Optimal. Leaf size=168

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{2bd^2n\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{de\left(a+b\log\left(cx^n\right)\right)^2}{x^2}-\frac{bden\left(a+b\log\left(cx^n\right)\right)}{x^2}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{x}$$

```
[Out] -2/27*b^2*d^2*n^2/x^3-1/2*b^2*d*e*n^2/x^2-2*b^2*e^2*n^2/x-2/9*b*d^2*n*(a+b*
ln(c*x^n))/x^3-b*d*e*n*(a+b*ln(c*x^n))/x^2-2*b*e^2*n*(a+b*ln(c*x^n))/x-1/3*
d^2*(a+b*ln(c*x^n))^2/x^3-d*e*(a+b*ln(c*x^n))^2/x^2-e^2*(a+b*ln(c*x^n))^2/x
```

Rubi [A] time = 0.21, antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2353, 2305, 2304}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{2bd^2n\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{de\left(a+b\log\left(cx^n\right)\right)^2}{x^2}-\frac{bden\left(a+b\log\left(cx^n\right)\right)}{x^2}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x^4,x]
```

```
[Out] (-2*b^2*d^2*n^2)/(27*x^3) - (b^2*d*e*n^2)/(2*x^2) - (2*b^2*e^2*n^2)/x - (2*
b*d^2*n*(a + b*Log[c*x^n]))/(9*x^3) - (b*d*e*n*(a + b*Log[c*x^n]))/x^2 - (2
*b*e^2*n*(a + b*Log[c*x^n]))/x - (d^2*(a + b*Log[c*x^n])^2)/(3*x^3) - (d*e*
(a + b*Log[c*x^n])^2)/x^2 - (e^2*(a + b*Log[c*x^n])^2)/x
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int \frac{(d+ex)^2 \left(a+b\log\left(cx^n\right)\right)^2}{x^4}\,dx = \int \left(\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{x^4} + \frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x^3} + \frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\right.$$

$$= d^2\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^4}\,dx + (2de)\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^3}\,dx + e^2\int \frac{\left(a+b\right.}{}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{3x^3} - \frac{de\left(a+b\log\left(cx^n\right)\right)^2}{x^2} - \frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{x} + \frac{1}{3}\left(\right.$$

$$= -\frac{2b^2d^2n^2}{27x^3} - \frac{b^2den^2}{2x^2} - \frac{2b^2e^2n^2}{x} - \frac{2bd^2n\left(a+b\log\left(cx^n\right)\right)}{9x^3} - \frac{bden\left(a+b\log\right.}{x^2}$$

Mathematica [A] time = 0.10, size = 131, normalized size = 0.78

$$-\frac{18d^2\left(a+b\log\left(cx^n\right)\right)^2 + 4bd^2n\left(3a+3b\log\left(cx^n\right)+bn\right) + 54dex\left(a+b\log\left(cx^n\right)\right)^2 + 27bdenx\left(2a+2b\log\left(\right.\right.}{54x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x^4,x]
```

```
[Out] -1/54*(18*d^2*(a + b*Log[c*x^n])^2 + 54*d*e*x*(a + b*Log[c*x^n])^2 + 54*e^2
*x^2*(a + b*Log[c*x^n])^2 + 108*b*e^2*n*x^2*(a + b*n + b*Log[c*x^n]) + 27*b
*d*e*n*x*(2*a + b*n + 2*b*Log[c*x^n]) + 4*b*d^2*n*(3*a + b*n + 3*b*Log[c*x^
n]))/x^3
```

fricas [B] time = 0.81, size = 326, normalized size = 1.94

$$-\frac{4\,b^2d^2n^2 + 12\,abd^2n + 18\,a^2d^2 + 54\left(2\,b^2e^2n^2 + 2\,abe^2n + a^2e^2\right)x^2 + 18\left(3\,b^2e^2x^2 + 3\,b^2dex + b^2d^2\right)\log(c)^2 + }{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^4,x, algorithm="fricas")
```

```
[Out] -1/54*(4*b^2*d^2*n^2 + 12*a*b*d^2*n + 18*a^2*d^2 + 54*(2*b^2*e^2*n^2 + 2*a*
b*e^2*n + a^2*e^2)*x^2 + 18*(3*b^2*e^2*x^2 + 3*b^2*d*e*x + b^2*d^2)*log(c)^
2 + 18*(3*b^2*e^2*n^2*x^2 + 3*b^2*d*e*n^2*x + b^2*d^2*n^2)*log(x)^2 + 27*(b
^2*d*e*n^2 + 2*a*b*d*e*n + 2*a^2*d*e)*x + 6*(2*b^2*d^2*n + 6*a*b*d^2 + 18*(
b^2*e^2*n + a*b*e^2)*x^2 + 9*(b^2*d*e*n + 2*a*b*d*e)*x)*log(c) + 6*(2*b^2*d
^2*n^2 + 6*a*b*d^2*n + 18*(b^2*e^2*n^2 + a*b*e^2*n)*x^2 + 9*(b^2*d*e*n^2 +
2*a*b*d*e*n)*x + 6*(3*b^2*e^2*n*x^2 + 3*b^2*d*e*n*x + b^2*d^2*n)*log(c))*lo
g(x))/x^3
```

giac [B] time = 0.44, size = 366, normalized size = 2.18

$$-\frac{54\,b^2n^2x^2e^2\log(x)^2 + 54\,b^2dn^2xe\log(x)^2 + 108\,b^2n^2x^2e^2\log(x) + 54\,b^2dn^2xe\log(x) + 108\,b^2nx^2e^2\log(c)\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^4,x, algorithm="giac")
```

```
[Out] -1/54*(54*b^2*n^2*x^2*e^2*log(x)^2 + 54*b^2*d*n^2*x*e*log(x)^2 + 108*b^2*n^
2*x^2*e^2*log(x) + 54*b^2*d*n^2*x*e*log(x) + 108*b^2*n*x^2*e^2*log(c)*log(x
) + 108*b^2*d*n*x*e*log(c)*log(x) + 18*b^2*d^2*n^2*log(x)^2 + 108*b^2*n^2*x
^2*e^2 + 27*b^2*d*n^2*x*e + 108*b^2*n*x^2*e^2*log(c) + 54*b^2*d*n*x*e*log(c
) + 54*b^2*x^2*e^2*log(c)^2 + 54*b^2*d*x*e*log(c)^2 + 12*b^2*d^2*n^2*log(x)
```

```
 + 108*a*b*n*x^2*e^2*log(x) + 108*a*b*d*n*x*e*log(x) + 36*b^2*d^2*n*log(c)*
log(x) + 4*b^2*d^2*n^2 + 108*a*b*n*x^2*e^2 + 54*a*b*d*n*x*e + 12*b^2*d^2*n*
log(c) + 108*a*b*x^2*e^2*log(c) + 108*a*b*d*x*e*log(c) + 18*b^2*d^2*log(c)^
2 + 36*a*b*d^2*n*log(x) + 12*a*b*d^2*n + 54*a^2*x^2*e^2 + 54*a^2*d*x*e + 36
*a*b*d^2*log(c) + 18*a^2*d^2)/x^3
```

maple [C] time = 0.30, size = 2473, normalized size = 14.72

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(b*ln(c*x^n)+a)^2/x^4,x)
```

```
[Out] -1/3*b^2*(3*e^2*x^2+3*d*e*x+d^2)/x^3*ln(x^n)^2-1/9*(-9*I*Pi*b^2*d*e*x*csgn(
I*c*x^n)^3+3*I*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-9*I*Pi*b^2*e^2*x^2*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+9*I*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c
)+18*b^2*e^2*x^2*ln(c)+18*b^2*e^2*n*x^2+18*a*b*e^2*x^2-3*I*Pi*b^2*d^2*csgn(
I*c*x^n)^3-9*I*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b^2*
d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+9*I*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I
*c*x^n)^2+18*b^2*d*e*x*ln(c)+9*b^2*d*e*n*x+18*a*b*d*e*x+3*I*Pi*b^2*d^2*csgn
(I*c*x^n)^2*csgn(I*c)+9*I*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+9*I*Pi*b
^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-9*I*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3+6
*ln(c)*b^2*d^2+2*b^2*d^2*n+6*a*b*d^2)/x^3*ln(x^n)-1/108*(108*b^2*e^2*x^2*ln
(c)^2+36*a^2*d^2+36*b^2*d^2*ln(c)^2+8*b^2*d^2*n^2+108*a^2*d*e*x-9*Pi^2*b^2*
d^2*csgn(I*c*x^n)^6+72*a*b*d^2*ln(c)+24*b^2*d^2*n*ln(c)+108*a^2*e^2*x^2+24*
a*b*d^2*n+216*a*b*e^2*n*x^2+108*b^2*d*e*x*ln(c)^2+216*a*b*e^2*x^2*ln(c)+216
*b^2*e^2*n*x^2*ln(c)+54*Pi^2*b^2*e^2*x^2*csgn(I*c)*csgn(I*x^n)^2*csgn(I*c*x
^n)^3-108*I*Pi*a*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-108*I*n*Pi*b
^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+18*Pi^2*b^2*d^2*csgn(I*c)*cs
gn(I*x^n)^2*csgn(I*c*x^n)^3+36*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)
+12*I*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)^2+36*I*Pi*a*b*d^2*csgn(I*x^n)*
csgn(I*c*x^n)^2+36*I*Pi*a*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+36*I*ln(c)*Pi*b^2
*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-54*I*Pi*b^2*d*e*n*x*csgn(I*c*x^n)^3-36*I*l
n(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-27*Pi^2*b^2*d*e*x*csgn(
I*x^n)^2*csgn(I*c*x^n)^4+54*Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5+216*
b^2*e^2*n^2*x^2-108*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-108*
I*Pi*ln(c)*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-54*I*Pi*b^2*d*e*n*
x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+108*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I
*c*x^n)^2+108*I*Pi*a*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-27*Pi^2*b^2*e^2*x^2*
csgn(I*c)^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2-108*Pi^2*b^2*e^2*x^2*csgn(I*c)*cs
gn(I*x^n)*csgn(I*c*x^n)^4+54*Pi^2*b^2*e^2*x^2*csgn(I*c)^2*csgn(I*x^n)*csgn(
I*c*x^n)^3+108*I*ln(c)*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+108*I*ln(c)
*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+54*I*Pi*b^2*d*e*n*x*csgn(I*x^n)*csg
n(I*c*x^n)^2+54*Pi^2*b^2*d*e*x*csgn(I*c)*csgn(I*c*x^n)^5-27*Pi^2*b^2*d*e*x*
csgn(I*c)^2*csgn(I*c*x^n)^4-36*Pi^2*b^2*d^2*csgn(I*c)*csgn(I*x^n)*csgn(I*c*
x^n)^4+18*Pi^2*b^2*d^2*csgn(I*c)^2*csgn(I*x^n)*csgn(I*c*x^n)^3-9*Pi^2*b^2*d
^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+18*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^
5+18*Pi^2*b^2*d^2*csgn(I*c)*csgn(I*c*x^n)^5-9*Pi^2*b^2*d^2*csgn(I*c)^2*csgn
(I*c*x^n)^4-36*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-12*I*Pi*b^2
*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-108*I*Pi*a*b*d*e*x*csgn(I*c*x^n)
^3+108*I*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-27*Pi^2*b^2*e^2*x^2*c
sgn(I*c*x^n)^6+108*I*Pi*ln(c)*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+108*I
*Pi*ln(c)*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-108*I*Pi*ln(c)*b^2*d*e*x*cs
gn(I*c*x^n)^3+108*I*Pi*a*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+108*I*Pi*a*b
*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+108*I*n*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*c
sgn(I*c)+108*a*b*d*e*n*x-9*Pi^2*b^2*d^2*csgn(I*c)^2*csgn(I*x^n)^2*csgn(I*c*
x^n)^2-108*I*n*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3-108*I*Pi*ln(c)*b^2*e^2*x^2*cs
gn(I*c*x^n)^3-108*I*Pi*a*b*e^2*x^2*csgn(I*c*x^n)^3+12*I*Pi*b^2*d^2*n*csgn(I
*c*x^n)^2*csgn(I*c)+54*Pi^2*b^2*d*e*x*csgn(I*c)*csgn(I*x^n)^2*csgn(I*c*x^n)
^3-27*Pi^2*b^2*d*e*x*csgn(I*c)^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2+54*b^2*d*e*n
```

```
^2*x-27*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+54*Pi^2*b^2*e^2*x^2*
csgn(I*x^n)*csgn(I*c*x^n)^5+54*Pi^2*b^2*e^2*x^2*csgn(I*c)*csgn(I*c*x^n)^5-2
7*Pi^2*b^2*e^2*x^2*csgn(I*c)^2*csgn(I*c*x^n)^4-27*Pi^2*b^2*d*e*x*csgn(I*c*x
^n)^6+216*a*b*d*e*x*ln(c)+108*b^2*d*e*n*x*ln(c)-108*Pi^2*b^2*d*e*x*csgn(I*c
)*csgn(I*x^n)*csgn(I*c*x^n)^4+54*Pi^2*b^2*d*e*x*csgn(I*c)^2*csgn(I*x^n)*csg
n(I*c*x^n)^3-36*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^3-36*I*Pi*a*b*d^2*csgn(I*c
*x^n)^3-12*I*Pi*b^2*d^2*n*csgn(I*c*x^n)^3-108*I*Pi*ln(c)*b^2*e^2*x^2*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)+54*I*n*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)
)/x^3
```

maxima [A] time = 0.74, size = 250, normalized size = 1.49

$$-2\,b^2e^2\left(\frac{n^2}{x}+\frac{n\log\left(cx^n\right)}{x}\right)-\frac{1}{2}\,b^2de\left(\frac{n^2}{x^2}+\frac{2\,n\log\left(cx^n\right)}{x^2}\right)-\frac{2}{27}\,b^2d^2\left(\frac{n^2}{x^3}+\frac{3\,n\log\left(cx^n\right)}{x^3}\right)-\frac{b^2e^2\log\left(cx^n\right)^2}{x}-\frac{2\,abe^2 \cdots}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^4,x, algorithm="maxima")
```

```
[Out] -2*b^2*e^2*(n^2/x + n*log(c*x^n)/x) - 1/2*b^2*d*e*(n^2/x^2 + 2*n*log(c*x^n)
/x^2) - 2/27*b^2*d^2*(n^2/x^3 + 3*n*log(c*x^n)/x^3) - b^2*e^2*log(c*x^n)^2/
x - 2*a*b*e^2*n/x - 2*a*b*e^2*log(c*x^n)/x - b^2*d*e*log(c*x^n)^2/x^2 - a*b
*d*e*n/x^2 - a^2*e^2/x - 2*a*b*d*e*log(c*x^n)/x^2 - 1/3*b^2*d^2*log(c*x^n)^
2/x^3 - 2/9*a*b*d^2*n/x^3 - a^2*d*e/x^2 - 2/3*a*b*d^2*log(c*x^n)/x^3 - 1/3*
a^2*d^2/x^3
```

mupad [B] time = 3.90, size = 184, normalized size = 1.10

$$-\frac{x\,\left(9\,d\,e\,a^2+9\,d\,e\,a\,b\,n+\frac{9\,d\,e\,b^2\,n^2}{2}\right)+x^2\,\left(9\,a^2\,e^2+18\,a\,b\,e^2\,n+18\,b^2\,e^2\,n^2\right)+3\,a^2\,d^2+\frac{2\,b^2\,d^2\,n^2}{3}+2\,a\,b\,d^2\,n}{9\,x^3}-\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))^2*(d + e*x)^2)/x^4,x)
```

```
[Out] - (x*(9*a^2*d*e + (9*b^2*d*e*n^2)/2 + 9*a*b*d*e*n) + x^2*(9*a^2*e^2 + 18*b^
2*e^2*n^2 + 18*a*b*e^2*n) + 3*a^2*d^2 + (2*b^2*d^2*n^2)/3 + 2*a*b*d^2*n)/(9
*x^3) - (log(c*x^n)^2*((b^2*d^2)/3 + b^2*e^2*x^2 + b^2*d*e*x))/x^3 - (log(c
*x^n)*((2*b*d^2*(3*a + b*n))/3 + 6*b*e^2*x^2*(a + b*n) + 3*b*d*e*x*(2*a + b
*n)))/(3*x^3)
```

sympy [B] time = 2.41, size = 479, normalized size = 2.85

$$-\frac{a^2d^2}{3x^3}-\frac{a^2de}{x^2}-\frac{a^2e^2}{x}-\frac{2abd^2n\log\left(x\right)}{3x^3}-\frac{2abd^2n}{9x^3}-\frac{2abd^2\log\left(c\right)}{3x^3}-\frac{2abden\log\left(x\right)}{x^2}-\frac{abden}{x^2}-\frac{2abde\log\left(c\right)}{x^2}-\frac{2abe^2n\log \cdots}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))**2/x**4,x)
```

```
[Out] -a**2*d**2/(3*x**3) - a**2*d*e/x**2 - a**2*e**2/x - 2*a*b*d**2*n*log(x)/(3*
x**3) - 2*a*b*d**2*n/(9*x**3) - 2*a*b*d**2*log(c)/(3*x**3) - 2*a*b*d*e*n*lo
g(x)/x**2 - a*b*d*e*n/x**2 - 2*a*b*d*e*log(c)/x**2 - 2*a*b*e**2*n*log(x)/x
- 2*a*b*e**2*n/x - 2*a*b*e**2*log(c)/x - b**2*d**2*n**2*log(x)**2/(3*x**3)
- 2*b**2*d**2*n**2*log(x)/(9*x**3) - 2*b**2*d**2*n**2/(27*x**3) - 2*b**2*d*
*2*n*log(c)*log(x)/(3*x**3) - 2*b**2*d**2*n*log(c)/(9*x**3) - b**2*d**2*log
(c)**2/(3*x**3) - b**2*d*e*n**2*log(x)**2/x**2 - b**2*d*e*n**2*log(x)/x**2
- b**2*d*e*n**2/(2*x**2) - 2*b**2*d*e*n*log(c)*log(x)/x**2 - b**2*d*e*n*log
(c)/x**2 - b**2*d*e*log(c)**2/x**2 - b**2*e**2*n**2*log(x)**2/x - 2*b**2*e*
*2*n**2*log(x)/x - 2*b**2*e**2*n**2/x - 2*b**2*e**2*n*log(c)*log(x)/x - 2*b
**2*e**2*n*log(c)/x - b**2*e**2*log(c)**2/x
```

3.91 $\int \frac{(d+ex)^2(a+b\log(cx^n))^2}{x^5}\,dx$

Optimal. Leaf size=178

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{4x^4}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{8x^4}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{4bden\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{e^2\left(a+b\log\left(cx^n\right)\right.}{2x^2}$$

```
[Out] -1/32*b^2*d^2*n^2/x^4-4/27*b^2*d*e*n^2/x^3-1/4*b^2*e^2*n^2/x^2-1/8*b*d^2*n*
(a+b*ln(c*x^n))/x^4-4/9*b*d*e*n*(a+b*ln(c*x^n))/x^3-1/2*b*e^2*n*(a+b*ln(c*x
^n))/x^2-1/4*d^2*(a+b*ln(c*x^n))^2/x^4-2/3*d*e*(a+b*ln(c*x^n))^2/x^3-1/2*e^
2*(a+b*ln(c*x^n))^2/x^2
```

Rubi [A] time = 0.21, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.130$, Rules used = {2353, 2305, 2304}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{4x^4}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{8x^4}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{4bden\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{e^2\left(a+b\log\left(cx^n\right)\right.}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x^5,x]
```

```
[Out] -(b^2*d^2*n^2)/(32*x^4) - (4*b^2*d*e*n^2)/(27*x^3) - (b^2*e^2*n^2)/(4*x^2)
- (b*d^2*n*(a + b*Log[c*x^n]))/(8*x^4) - (4*b*d*e*n*(a + b*Log[c*x^n]))/(9*
x^3) - (b*e^2*n*(a + b*Log[c*x^n]))/(2*x^2) - (d^2*(a + b*Log[c*x^n])^2)/(4
*x^4) - (2*d*e*(a + b*Log[c*x^n])^2)/(3*x^3) - (e^2*(a + b*Log[c*x^n])^2)/(
2*x^2)
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int \frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)^2}{x^5}\,dx = \int\left(\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{x^5}+\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x^4}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{x^3}\right)$$

$$= d^2\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^5}\,dx+(2de)\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^4}\,dx+e^2\int\frac{(a+b$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{4x^4}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}+\frac{1}{2}$$

$$= -\frac{b^2d^2n^2}{32x^4}-\frac{4b^2den^2}{27x^3}-\frac{b^2e^2n^2}{4x^2}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{8x^4}-\frac{4bden\left(a+b\log\right.}{9x^3}$$

Mathematica [A] time = 0.10, size = 134, normalized size = 0.75

$$-\frac{216d^2\left(a+b\log\left(cx^n\right)\right)^2+27bd^2n\left(4a+4b\log\left(cx^n\right)+bn\right)+576dex\left(a+b\log\left(cx^n\right)\right)^2+128bdenx\left(3a+3b\right.}{864x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x^5,x]
```

```
[Out] -1/864*(216*d^2*(a + b*Log[c*x^n])^2 + 576*d*e*x*(a + b*Log[c*x^n])^2 + 432
*e^2*x^2*(a + b*Log[c*x^n])^2 + 216*b*e^2*n*x^2*(2*a + b*n + 2*b*Log[c*x^n]
) + 128*b*d*e*n*x*(3*a + b*n + 3*b*Log[c*x^n]) + 27*b*d^2*n*(4*a + b*n + 4*
b*Log[c*x^n]))/x^4
```

fricas [B] time = 0.59, size = 332, normalized size = 1.87

$$-\frac{27\,b^2d^2n^2+108\,abd^2n+216\,a^2d^2+216\left(b^2e^2n^2+2\,abe^2n+2\,a^2e^2\right)x^2+72\left(6\,b^2e^2x^2+8\,b^2dex+3\,b^2d^2\right)\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^5,x, algorithm="fricas")
```

```
[Out] -1/864*(27*b^2*d^2*n^2 + 108*a*b*d^2*n + 216*a^2*d^2 + 216*(b^2*e^2*n^2 + 2
*a*b*e^2*n + 2*a^2*e^2)*x^2 + 72*(6*b^2*e^2*x^2 + 8*b^2*d*e*x + 3*b^2*d^2)*
log(c)^2 + 72*(6*b^2*e^2*n^2*x^2 + 8*b^2*d*e*n^2*x + 3*b^2*d^2*n^2)*log(x)^
2 + 64*(2*b^2*d*e*n^2 + 6*a*b*d*e*n + 9*a^2*d*e)*x + 12*(9*b^2*d^2*n + 36*a
*b*d^2 + 36*(b^2*e^2*n + 2*a*b*e^2)*x^2 + 32*(b^2*d*e*n + 3*a*b*d*e)*x)*log
(c) + 12*(9*b^2*d^2*n^2 + 36*a*b*d^2*n + 36*(b^2*e^2*n^2 + 2*a*b*e^2*n)*x^2
 + 32*(b^2*d*e*n^2 + 3*a*b*d*e*n)*x + 12*(6*b^2*e^2*n*x^2 + 8*b^2*d*e*n*x +
 3*b^2*d^2*n)*log(c))*log(x))/x^4
```

giac [B] time = 0.36, size = 366, normalized size = 2.06

$$-\frac{432\,b^2n^2x^2e^2\log(x)^2+576\,b^2dn^2xe\log(x)^2+432\,b^2n^2x^2e^2\log(x)+384\,b^2dn^2xe\log(x)+864\,b^2nx^2e^2\log(c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^5,x, algorithm="giac")
```

```
[Out] -1/864*(432*b^2*n^2*x^2*e^2*log(x)^2 + 576*b^2*d*n^2*x*e*log(x)^2 + 432*b^2
*n^2*x^2*e^2*log(x) + 384*b^2*d*n^2*x*e*log(x) + 864*b^2*n*x^2*e^2*log(c)*l
og(x) + 1152*b^2*d*n*x*e*log(c)*log(x) + 216*b^2*d^2*n^2*log(x)^2 + 216*b^2
*n^2*x^2*e^2 + 128*b^2*d*n^2*x*e + 432*b^2*n*x^2*e^2*log(c) + 384*b^2*d*n*x
*e*log(c) + 432*b^2*x^2*e^2*log(c)^2 + 576*b^2*d*x*e*log(c)^2 + 108*b^2*d^2
```

```
*n^2*log(x) + 864*a*b*n*x^2*e^2*log(x) + 1152*a*b*d*n*x*e*log(x) + 432*b^2*
d^2*n*log(c)*log(x) + 27*b^2*d^2*n^2 + 432*a*b*n*x^2*e^2 + 384*a*b*d*n*x*e
+ 108*b^2*d^2*n*log(c) + 864*a*b*x^2*e^2*log(c) + 1152*a*b*d*x*e*log(c) + 2
16*b^2*d^2*log(c)^2 + 432*a*b*d^2*n*log(x) + 108*a*b*d^2*n + 432*a^2*x^2*e^
2 + 576*a^2*d*x*e + 432*a*b*d^2*log(c) + 216*a^2*d^2)/x^4
```

maple [C] time = 0.33, size = 2475, normalized size = 13.90

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(b*ln(c*x^n)+a)^2/x^5,x)
```

```
[Out] -1/12*b^2*(6*e^2*x^2+8*d*e*x+3*d^2)/x^4*ln(x^n)^2-1/72*(18*I*Pi*b^2*d^2*csg
n(I*c*x^n)^2*csgn(I*c)-18*I*Pi*b^2*d^2*csgn(I*c*x^n)^3-48*I*Pi*b^2*d*e*x*cs
gn(I*c*x^n)^3+36*I*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+72*b^2*e^2*x^2*
ln(c)+36*b^2*e^2*n*x^2+72*a*b*e^2*x^2-36*I*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)-18*I*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+48*I
*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-48*I*Pi*b^2*d*e*x*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)+96*b^2*d*e*x*ln(c)+32*b^2*d*e*n*x+96*a*b*d*e*x+48*I*Pi
*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+18*I*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x
^n)^2-36*I*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3+36*I*Pi*b^2*e^2*x^2*csgn(I*x^n)*c
sgn(I*c*x^n)^2+36*b^2*d^2*ln(c)+9*b^2*d^2*n+36*a*b*d^2)/x^4*ln(x^n)-1/864*(
432*b^2*e^2*x^2*ln(c)^2+216*a^2*d^2+216*b^2*d^2*ln(c)^2+27*b^2*d^2*n^2+576*
a^2*d*e*x-54*Pi^2*b^2*d^2*csgn(I*c*x^n)^6+432*a*b*d^2*ln(c)+108*b^2*d^2*n*l
n(c)+432*a^2*e^2*x^2+108*a*b*d^2*n+432*a*b*e^2*n*x^2-216*I*n*Pi*b^2*e^2*x^2
*csgn(I*c*x^n)^3-432*I*Pi*ln(c)*b^2*e^2*x^2*csgn(I*c*x^n)^3-432*I*Pi*a*b*e^
2*x^2*csgn(I*c*x^n)^3+576*b^2*d*e*x*ln(c)^2+864*a*b*e^2*x^2*ln(c)+432*b^2*e
^2*n*x^2*ln(c)-192*I*Pi*b^2*d*e*n*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-576
*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+54*I*Pi*b^2*d^2*n*csgn(
I*c*x^n)^2*csgn(I*c)+216*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+216*I*Pi*
a*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+216*Pi^2*b^2*e^2*x^2*csgn(I*c)*csgn(I*x^n
)^2*csgn(I*c*x^n)^3-576*I*Pi*ln(c)*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)+216*I*n*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-192*I*Pi*b^2*d*e*n*x
*csgn(I*c*x^n)^3+108*Pi^2*b^2*d^2*csgn(I*c)*csgn(I*x^n)^2*csgn(I*c*x^n)^3+5
4*I*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)^2-144*Pi^2*b^2*d*e*x*csgn(I*x^n)
^2*csgn(I*c*x^n)^4+288*Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5+216*b^2*e
^2*n^2*x^2-216*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^3-216*I*Pi*a*b*d^2*csgn(I*c
*x^n)^3+576*I*ln(c)*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+576*I*ln(c)*Pi
*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+192*I*Pi*b^2*d*e*n*x*csgn(I*x^n)*csgn(
I*c*x^n)^2-54*I*Pi*b^2*d^2*n*csgn(I*c*x^n)^3+216*I*ln(c)*Pi*b^2*d^2*csgn(I*
x^n)*csgn(I*c*x^n)^2-108*Pi^2*b^2*e^2*x^2*csgn(I*c)^2*csgn(I*x^n)^2*csgn(I*
c*x^n)^2-432*Pi^2*b^2*e^2*x^2*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)^4+216*I*l
n(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)+216*Pi^2*b^2*e^2*x^2*csgn(I*c)^2*
csgn(I*x^n)*csgn(I*c*x^n)^3+288*Pi^2*b^2*d*e*x*csgn(I*c)*csgn(I*c*x^n)^5-14
4*Pi^2*b^2*d*e*x*csgn(I*c)^2*csgn(I*c*x^n)^4-216*Pi^2*b^2*d^2*csgn(I*c)*csg
n(I*x^n)*csgn(I*c*x^n)^4+108*Pi^2*b^2*d^2*csgn(I*c)^2*csgn(I*x^n)*csgn(I*c*
x^n)^3-54*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+108*Pi^2*b^2*d^2*csgn(
I*x^n)*csgn(I*c*x^n)^5+108*Pi^2*b^2*d^2*csgn(I*c)*csgn(I*c*x^n)^5-54*Pi^2*b
^2*d^2*csgn(I*c)^2*csgn(I*c*x^n)^4-108*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^6+384
*a*b*d*e*n*x+432*I*Pi*ln(c)*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-576*I*Pi*
ln(c)*b^2*d*e*x*csgn(I*c*x^n)^3+432*I*Pi*a*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x
^n)^2+432*I*Pi*a*b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-54*I*Pi*b^2*d^2*n*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-576*I*Pi*a*b*d*e*x*csgn(I*c*x^n)^3+216*I*n*
Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+432*I*Pi*ln(c)*b^2*e^2*x^2*csgn(
I*x^n)*csgn(I*c*x^n)^2-216*I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)-216*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+576*I*Pi*a*b*d*
e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+576*I*Pi*a*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c
)-54*Pi^2*b^2*d^2*csgn(I*c)^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2+288*Pi^2*b^2*d*
e*x*csgn(I*c)*csgn(I*x^n)^2*csgn(I*c*x^n)^3-144*Pi^2*b^2*d*e*x*csgn(I*c)^2*
```

csgn(I*x^n)^2*csgn(I*c*x^n)^2+128*b^2*d*e*n^2*x-108*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+216*Pi^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^5+216*Pi^2*b^2*e^2*x^2*csgn(I*c)*csgn(I*c*x^n)^5-108*Pi^2*b^2*e^2*x^2*csgn(I*c)^2*csgn(I*c*x^n)^4-144*Pi^2*b^2*d*e*x*csgn(I*c*x^n)^6-432*I*Pi*ln(c)*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+192*I*n*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-432*I*Pi*a*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-216*I*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1152*a*b*d*e*x*ln(c)+384*b^2*d*e*n*x*ln(c)-576*Pi^2*b^2*d*e*x*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)^4+288*Pi^2*b^2*d*e*x*csgn(I*c)^2*csgn(I*x^n)*csgn(I*c*x^n)^3)/x^4

maxima [A] time = 0.80, size = 251, normalized size = 1.41

$$-\frac{1}{4}b^2e^2\left(\frac{n^2}{x^2}+\frac{2n\log(cx^n)}{x^2}\right)-\frac{4}{27}b^2de\left(\frac{n^2}{x^3}+\frac{3n\log(cx^n)}{x^3}\right)-\frac{1}{32}b^2d^2\left(\frac{n^2}{x^4}+\frac{4n\log(cx^n)}{x^4}\right)-\frac{b^2e^2\log(cx^n)^2}{2x^2}-\frac{abe}{2\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^5,x, algorithm="maxima")
```

```
[Out] -1/4*b^2*e^2*(n^2/x^2 + 2*n*log(c*x^n)/x^2) - 4/27*b^2*d*e*(n^2/x^3 + 3*n*log(c*x^n)/x^3) - 1/32*b^2*d^2*(n^2/x^4 + 4*n*log(c*x^n)/x^4) - 1/2*b^2*e^2*log(c*x^n)^2/x^2 - 1/2*a*b*e^2*n/x^2 - a*b*e^2*log(c*x^n)/x^2 - 2/3*b^2*d*e*log(c*x^n)^2/x^3 - 4/9*a*b*d*e*n/x^3 - 1/2*a^2*e^2/x^2 - 4/3*a*b*d*e*log(c*x^n)/x^3 - 1/4*b^2*d^2*log(c*x^n)^2/x^4 - 1/8*a*b*d^2*n/x^4 - 2/3*a^2*d*e/x^3 - 1/2*a*b*d^2*log(c*x^n)/x^4 - 1/4*a^2*d^2/x^4
```

mupad [B] time = 3.67, size = 188, normalized size = 1.06

$$-\frac{x\left(48\,d\,e\,a^2+32\,d\,e\,a\,b\,n+\frac{32\,d\,e\,b^2\,n^2}{3}\right)+x^2\,\left(36\,a^2\,e^2+36\,a\,b\,e^2\,n+18\,b^2\,e^2\,n^2\right)+18\,a^2\,d^2+\frac{9\,b^2\,d^2\,n^2}{4}+9\,a\,b\,d^2\ldots}{72\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))^2*(d + e*x)^2)/x^5,x)
```

```
[Out] - (x*(48*a^2*d*e + (32*b^2*d*e*n^2)/3 + 32*a*b*d*e*n) + x^2*(36*a^2*e^2 + 18*b^2*e^2*n^2 + 36*a*b*e^2*n) + 18*a^2*d^2 + (9*b^2*d^2*n^2)/4 + 9*a*b*d^2*n)/(72*x^4) - (log(c*x^n)^2*((b^2*d^2)/4 + (b^2*e^2*x^2)/2 + (2*b^2*d*e*x)/3))/x^4 - (log(c*x^n)*((3*b*d^2*(4*a + b*n))/4 + 3*b*e^2*x^2*(2*a + b*n) + (8*b*d*e*x*(3*a + b*n))/3))/(6*x^4)
```

sympy [B] time = 3.50, size = 512, normalized size = 2.88

$$-\frac{a^2d^2}{4x^4}-\frac{2a^2de}{3x^3}-\frac{a^2e^2}{2x^2}-\frac{abd^2n\log(x)}{2x^4}-\frac{abd^2n}{8x^4}-\frac{abd^2\log(c)}{2x^4}-\frac{4abden\log(x)}{3x^3}-\frac{4abden}{9x^3}-\frac{4abde\log(c)}{3x^3}-\frac{abe^2n\log(\ldots}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))**2/x**5,x)
```

```
[Out] -a**2*d**2/(4*x**4) - 2*a**2*d*e/(3*x**3) - a**2*e**2/(2*x**2) - a*b*d**2*n*log(x)/(2*x**4) - a*b*d**2*n/(8*x**4) - a*b*d**2*log(c)/(2*x**4) - 4*a*b*d*e*n*log(x)/(3*x**3) - 4*a*b*d*e*n/(9*x**3) - 4*a*b*d*e*log(c)/(3*x**3) - a*b*e**2*n*log(x)/x**2 - a*b*e**2*n/(2*x**2) - a*b*e**2*log(c)/x**2 - b**2*d**2*n**2*log(x)**2/(4*x**4) - b**2*d**2*n**2*log(x)/(8*x**4) - b**2*d**2*n**2/(32*x**4) - b**2*d**2*n*log(c)*log(x)/(2*x**4) - b**2*d**2*n*log(c)/(8*x**4) - b**2*d**2*log(c)**2/(4*x**4) - 2*b**2*d*e*n**2*log(x)**2/(3*x**3) - 4*b**2*d*e*n**2*log(x)/(9*x**3) - 4*b**2*d*e*n**2/(27*x**3) - 4*b**2*d*e*n*log(c)*log(x)/(3*x**3) - 4*b**2*d*e*n*log(c)/(9*x**3) - 2*b**2*d*e*log(c)**2/(3*x**3) - b**2*e**2*n**2*log(x)**2/(2*x**2) - b**2*e**2*n**2*log(x)/(2*x**2) - b**2*e**2*n**2/(4*x**2) - b**2*e**2*n*log(c)*log(x)/x**2 - b**2*e**2*n*log(c)/(2*x**2) - b**2*e**2*log(c)**2/(2*x**2)
```

3.92 $\int \frac{x^3(a+b\log(cx^n))^2}{d+ex}\,dx$

Optimal. Leaf size=271

$$-\frac{2bd^3n\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{d^3\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e^4}+\frac{d^2x\left(a+b\log\left(cx^n\right)\right)^2}{e^3}-\frac{dx^2\left(a+b\log\left(cx^n\right.\right.}{2e^2}$$

```
[Out] -2*a*b*d^2*n*x/e^3+2*b^2*d^2*n^2*x/e^3-1/4*b^2*d*n^2*x^2/e^2+2/27*b^2*n^2*x
^3/e-2*b^2*d^2*n*x*ln(c*x^n)/e^3+1/2*b*d*n*x^2*(a+b*ln(c*x^n))/e^2-2/9*b*n*
x^3*(a+b*ln(c*x^n))/e+d^2*x*(a+b*ln(c*x^n))^2/e^3-1/2*d*x^2*(a+b*ln(c*x^n))
^2/e^2+1/3*x^3*(a+b*ln(c*x^n))^2/e-d^3*(a+b*ln(c*x^n))^2*ln(1+e*x/d)/e^4-2*
b*d^3*n*(a+b*ln(c*x^n))*polylog(2,-e*x/d)/e^4+2*b^2*d^3*n^2*polylog(3,-e*x/
d)/e^4
```

Rubi [A] time = 0.28, antiderivative size = 271, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2353, 2296, 2295, 2305, 2304, 2317, 2374, 6589}

$$-\frac{2bd^3n\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2b^2d^3n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}-\frac{d^3\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e^4}+\frac{d^2x\left(a\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x),x]
```

```
[Out] (-2*a*b*d^2*n*x)/e^3 + (2*b^2*d^2*n^2*x)/e^3 - (b^2*d*n^2*x^2)/(4*e^2) + (2
*b^2*n^2*x^3)/(27*e) - (2*b^2*d^2*n*x*Log[c*x^n])/e^3 + (b*d*n*x^2*(a + b*L
og[c*x^n]))/(2*e^2) - (2*b*n*x^3*(a + b*Log[c*x^n]))/(9*e) + (d^2*x*(a + b*
Log[c*x^n])^2)/e^3 - (d*x^2*(a + b*Log[c*x^n])^2)/(2*e^2) + (x^3*(a + b*Log
[c*x^n])^2)/(3*e) - (d^3*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^4 - (2*b*
d^3*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^4 + (2*b^2*d^3*n^2*PolyL
og[3, -((e*x)/d)])/e^4
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3 \left(a+b\log \left(cx^n\right)\right)^2}{d+ex}\,dx = \int \left(\frac{d^2\left(a+b\log \left(cx^n\right)\right)^2}{e^3} - \frac{dx\left(a+b\log \left(cx^n\right)\right)^2}{e^2} + \frac{x^2\left(a+b\log \left(cx^n\right)\right)^2}{e} - \frac{d^3\left(a\right.}{e}\right.$$

$$= \frac{d^2\int \left(a+b\log \left(cx^n\right)\right)^2\,dx}{e^3} - \frac{d^3\int \frac{\left(a+b\log (cx^n)\right)^2}{d+ex}\,dx}{e^3} - \frac{d\int x\left(a+b\log \left(cx^n\right)\right)^2\,dx}{e^2} +$$

$$= \frac{d^2x\left(a+b\log \left(cx^n\right)\right)^2}{e^3} - \frac{dx^2\left(a+b\log \left(cx^n\right)\right)^2}{2e^2} + \frac{x^3\left(a+b\log \left(cx^n\right)\right)^2}{3e} - \frac{d^3\left(a+\right.}{}$$

$$= -\frac{2abd^2nx}{e^3} - \frac{b^2dn^2x^2}{4e^2} + \frac{2b^2n^2x^3}{27e} + \frac{bdnx^2\left(a+b\log \left(cx^n\right)\right)}{2e^2} - \frac{2bnx^3\left(a+b\log \left(\right.\right.}{9e}$$

$$= -\frac{2abd^2nx}{e^3} + \frac{2b^2d^2n^2x}{e^3} - \frac{b^2dn^2x^2}{4e^2} + \frac{2b^2n^2x^3}{27e} - \frac{2b^2d^2nx\log \left(cx^n\right)}{e^3} + \frac{bdnx^2\left(a+\right.}{2}$$

Mathematica [A] time = 0.17, size = 211, normalized size = 0.78

$$-\frac{216bd^3n\left(\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log \left(cx^n\right)\right)-bn\text{Li}_3\left(-\frac{ex}{d}\right)\right)+108d^3\log \left(\frac{ex}{d}+1\right)\left(a+b\log \left(cx^n\right)\right)^2-108d^2ex\left(a+b\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x),x]
```

```
[Out] -1/108*(-108*d^2*e*x*(a + b*Log[c*x^n])^2 + 54*d*e^2*x^2*(a + b*Log[c*x^n])
^2 - 36*e^3*x^3*(a + b*Log[c*x^n])^2 + 216*b*d^2*e*n*x*(a - b*n + b*Log[c*x
^n]) - 8*b*e^3*n*x^3*(b*n - 3*(a + b*Log[c*x^n])) + 27*b*d*e^2*n*x^2*(b*n -
```

```
2*(a + b*Log[c*x^n])) + 108*d^3*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 21
6*b*d^3*n*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*
x)/d)]))/e^4
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^3\log(cx^n)^2 + 2\,abx^3\log(cx^n) + a^2x^3}{ex+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*log(c*x^n)^2 + 2*a*b*x^3*log(c*x^n) + a^2*x^3)/(e*x + d),
 x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\log(cx^n) + a)^2 x^3}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^3/(e*x + d), x)
```

maple [F] time = 0.72, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n) + a)^2\,x^3}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)^2/(e*x+d),x)
```

```
[Out] int(x^3*(b*ln(c*x^n)+a)^2/(e*x+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{6}a^2\left(\frac{6\,d^3\log(ex+d)}{e^4} - \frac{2\,e^2x^3 - 3\,dex^2 + 6\,d^2x}{e^3}\right) + \int \frac{b^2x^3\log(x^n)^2 + 2\left(b^2\log(c) + ab\right)x^3\log(x^n) + \left(b^2\log(c)^2\right.}{ex+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] -1/6*a^2*(6*d^3*log(e*x + d)/e^4 - (2*e^2*x^3 - 3*d*e*x^2 + 6*d^2*x)/e^3) +
 integrate((b^2*x^3*log(x^n)^2 + 2*(b^2*log(c) + a*b)*x^3*log(x^n) + (b^2*l
og(c)^2 + 2*a*b*log(c))*x^3)/(e*x + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,(a + b\,\ln(c\,x^n))^2}{d + e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n))^2)/(d + e*x),x)
```

```
[Out] int((x^3*(a + b*log(c*x^n))^2)/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 \left(a + b \log \left(cx^n\right)\right)^2}{d + ex}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))**2/(e*x+d),x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))**2/(d + e*x), x)
```

3.93 $\int \frac{x^2(a+b\log(cx^n))^2}{d+ex}\,dx$

Optimal. Leaf size=200

$$\frac{2bd^2n\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{d^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e^3}-\frac{dx\left(a+b\log\left(cx^n\right)\right)^2}{e^2}-\frac{bnx^2\left(a+b\log\left(cx^n\right)\right)}{2e}$$

```
[Out] 2*a*b*d*n*x/e^2-2*b^2*d*n^2*x/e^2+1/4*b^2*n^2*x^2/e+2*b^2*d*n*x*ln(c*x^n)/e
^2-1/2*b*n*x^2*(a+b*ln(c*x^n))/e-d*x*(a+b*ln(c*x^n))^2/e^2+1/2*x^2*(a+b*ln(
c*x^n))^2/e+d^2*(a+b*ln(c*x^n))^2*ln(1+e*x/d)/e^3+2*b*d^2*n*(a+b*ln(c*x^n))
*polylog(2,-e*x/d)/e^3-2*b^2*d^2*n^2*polylog(3,-e*x/d)/e^3
```

Rubi [A] time = 0.22, antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {2353, 2296, 2295, 2305, 2304, 2317, 2374, 6589}

$$\frac{2bd^2n\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}-\frac{2b^2d^2n^2\mathrm{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^3}+\frac{d^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e^3}-\frac{dx\left(a+b\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x),x]
```

```
[Out] (2*a*b*d*n*x)/e^2 - (2*b^2*d*n^2*x)/e^2 + (b^2*n^2*x^2)/(4*e) + (2*b^2*d*n*
x*Log[c*x^n])/e^2 - (b*n*x^2*(a + b*Log[c*x^n]))/(2*e) - (d*x*(a + b*Log[c*
x^n])^2)/e^2 + (x^2*(a + b*Log[c*x^n])^2)/(2*e) + (d^2*(a + b*Log[c*x^n])^2
*Log[1 + (e*x)/d])/e^3 + (2*b*d^2*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d
)])/e^3 - (2*b^2*d^2*n^2*PolyLog[3, -((e*x)/d)])/e^3
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx = \int\left(-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{e^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)}\right)dx$$

$$= -\frac{d\int\left(a+b\log\left(cx^n\right)\right)^2\,dx}{e^2}+\frac{d^2\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx}{e^2}+\frac{\int x\left(a+b\log\left(cx^n\right)\right)^2\,dx}{e}$$

$$= -\frac{dx\left(a+b\log\left(cx^n\right)\right)^2}{e^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)^2}{2e}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right.}{e^3}$$

$$= \frac{2abdnx}{e^2}+\frac{b^2n^2x^2}{4e}-\frac{bnx^2\left(a+b\log\left(cx^n\right)\right)}{2e}-\frac{dx\left(a+b\log\left(cx^n\right)\right)^2}{e^2}+\frac{x^2\left(a+b\log\right.}{2e}$$

$$= \frac{2abdnx}{e^2}-\frac{2b^2dn^2x}{e^2}+\frac{b^2n^2x^2}{4e}+\frac{2b^2dnx\log\left(cx^n\right)}{e^2}-\frac{bnx^2\left(a+b\log\left(cx^n\right)\right)}{2e}-\frac{dx}{}$$

Mathematica [A] time = 0.10, size = 158, normalized size = 0.79

$$\frac{8bd^2n\left(\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\text{Li}_3\left(-\frac{ex}{d}\right)\right)+4d^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2-4dex\left(a+b\log\left(cx^n\right)\right)}{4e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x),x]
```

```
[Out] (-4*d*e*x*(a + b*Log[c*x^n])^2 + 2*e^2*x^2*(a + b*Log[c*x^n])^2 + 8*b*d*e*n
*x*(a - b*n + b*Log[c*x^n]) + b*e^2*n*x^2*(b*n - 2*(a + b*Log[c*x^n])) + 4*
d^2*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 8*b*d^2*n*((a + b*Log[c*x^n])*P
olyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x)/d)]))/(4*e^3)
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^2\log\left(cx^n\right)^2 + 2\,abx^2\log\left(cx^n\right) + a^2x^2}{ex+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*log(c*x^n)^2 + 2*a*b*x^2*log(c*x^n) + a^2*x^2)/(e*x + d),
 x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right) + a\right)^2 x^2}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^2/(e*x + d), x)
```

maple [F] time = 0.71, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right) + a\right)^2 x^2}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)^2/(e*x+d),x)
```

```
[Out] int(x^2*(b*ln(c*x^n)+a)^2/(e*x+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a^2\left(\frac{2\,d^2\log\left(ex+d\right)}{e^3} + \frac{ex^2 - 2\,dx}{e^2}\right) + \int \frac{b^2x^2\log\left(x^n\right)^2 + 2\left(b^2\log(c) + ab\right)x^2\log\left(x^n\right) + \left(b^2\log(c)^2 + 2\,ab\log(c)\right.}{ex+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] 1/2*a^2*(2*d^2*log(e*x + d)/e^3 + (e*x^2 - 2*d*x)/e^2) + integrate((b^2*x^2
*log(x^n)^2 + 2*(b^2*log(c) + a*b)*x^2*log(x^n) + (b^2*log(c)^2 + 2*a*b*log
(c))*x^2)/(e*x + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\left(a + b\,\ln\left(c\,x^n\right)\right)^2}{d + e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n))^2)/(d + e*x),x)
```

```
[Out] int((x^2*(a + b*log(c*x^n))^2)/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2\left(a + b\log\left(cx^n\right)\right)^2}{d + ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))**2/(e*x+d),x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))**2/(d + e*x), x)
```

3.94 $\int \frac{x(a+b\log(cx^n))^2}{d+ex}\,dx$

Optimal. Leaf size=130

$$-\frac{2bdn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e}-\frac{2abnx}{e}-\frac{2b^2nx\log\left(cx^n\right)}{e}$$

```
[Out] -2*a*b*n*x/e+2*b^2*n^2*x/e-2*b^2*n*x*ln(c*x^n)/e+x*(a+b*ln(c*x^n))^2/e-d*(a
+b*ln(c*x^n))^2*ln(1+e*x/d)/e^2-2*b*d*n*(a+b*ln(c*x^n))*polylog(2,-e*x/d)/e
^2+2*b^2*d*n^2*polylog(3,-e*x/d)/e^2
```

Rubi [A] time = 0.16, antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2353, 2296, 2295, 2317, 2374, 6589}

$$-\frac{2bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^2}-\frac{d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n])^2)/(d + e*x),x]
```

```
[Out] (-2*a*b*n*x)/e + (2*b^2*n^2*x)/e - (2*b^2*n*x*Log[c*x^n])/e + (x*(a + b*Log
[c*x^n])^2)/e - (d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^2 - (2*b*d*n*(a
 + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^2 + (2*b^2*d*n^2*PolyLog[3, -((e
*x)/d)])/e^2
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
```

```
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx=\int\left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{e}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)}\right)dx$$

$$=\frac{\int\left(a+b\log\left(cx^n\right)\right)^2\,dx}{e}-\frac{d\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx}{e}$$

$$=\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{e^2}+\frac{(2bdn)\int\frac{\left(a+b\log\left(cx^n\right)\right)\log(}{x}}{e^2}$$

$$=-\frac{2abnx}{e}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{e^2}-\frac{2bdn\left(a+b\,\mathrm{lo}\right.}{}$$

$$=-\frac{2abnx}{e}+\frac{2b^2n^2x}{e}-\frac{2b^2nx\log\left(cx^n\right)}{e}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{e^2}$$

Mathematica [A] time = 0.07, size = 103, normalized size = 0.79

$$\frac{-2bdn\left(\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\mathrm{Li}_3\left(-\frac{ex}{d}\right)\right)-d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2+ex\left(a+b\log\left(cx^n\right)\right)^2-2}{e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n])^2)/(d + e*x),x]
```

```
[Out] (e*x*(a + b*Log[c*x^n])^2 - 2*b*e*n*x*(a - b*n + b*Log[c*x^n]) - d*(a + b*L
og[c*x^n])^2*Log[1 + (e*x)/d] - 2*b*d*n*((a + b*Log[c*x^n])*PolyLog[2, -((e
*x)/d)] - b*n*PolyLog[3, -((e*x)/d)]))/e^2
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2x\log\left(cx^n\right)^2+2\,abx\log\left(cx^n\right)+a^2x}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*x*log(c*x^n)^2 + 2*a*b*x*log(c*x^n) + a^2*x)/(e*x + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^2x}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x/(e*x + d), x)
```

maple [F] time = 0.68, size = 0, normalized size = 0.00

$$\int \frac{\left(b \ln \left(c\,x^{n}\right)+a\right)^{2} x}{e x+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)^2/(e*x+d),x)
```

```
[Out] int(x*(b*ln(c*x^n)+a)^2/(e*x+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a^{2}\left(\frac{x}{e}-\frac{d\log\left(ex+d\right)}{e^{2}}\right)+\int \frac{b^{2}x\log\left(x^{n}\right)^{2}+2\left(b^{2}\log(c)+ab\right)x\log\left(x^{n}\right)+\left(b^{2}\log(c)^{2}+2\,ab\log(c)\right)x}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] a^2*(x/e - d*log(e*x + d)/e^2) + integrate((b^2*x*log(x^n)^2 + 2*(b^2*log(c
) + a*b)*x*log(x^n) + (b^2*log(c)^2 + 2*a*b*log(c))*x)/(e*x + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n))^2)/(d + e*x),x)
```

```
[Out] int((x*(a + b*log(c*x^n))^2)/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \left(a + b \log{\left(c x^{n} \right)}\right)^{2}}{d + e x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))**2/(e*x+d),x)
```

```
[Out] Integral(x*(a + b*log(c*x**n))**2/(d + e*x), x)
```

3.95 $\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx$

Optimal. Leaf size=72

$$\frac{2bn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e}+\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e}-\frac{2b^2n^2\text{Li}_3\left(-\frac{ex}{d}\right)}{e}$$

```
[Out] (a+b*ln(c*x^n))^2*ln(1+e*x/d)/e+2*b*n*(a+b*ln(c*x^n))*polylog(2,-e*x/d)/e-2
*b^2*n^2*polylog(3,-e*x/d)/e
```

Rubi [A] time = 0.06, antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {2317, 2374, 6589}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e}+\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(d + e*x),x]
```

```
[Out] ((a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e + (2*b*n*(a + b*Log[c*x^n])*PolyL
og[2, -((e*x)/d)])/e - (2*b^2*n^2*PolyLog[3, -((e*x)/d)])/e
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx &= \frac{\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{e}-\frac{(2bn)\int \frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{e}\\
&= \frac{\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{e}+\frac{2bn\left(a+b\log\left(cx^n\right)\right)\text{Li}_2\left(-\frac{ex}{d}\right)}{e}-\frac{\left(2b^2n^2\right)\int \frac{\text{Li}_2\left(-\frac{ex}{d}\right)}{x}}{e}\\
&= \frac{\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{e}+\frac{2bn\left(a+b\log\left(cx^n\right)\right)\text{Li}_2\left(-\frac{ex}{d}\right)}{e}-\frac{2b^2n^2\text{Li}_3\left(-\frac{ex}{d}\right)}{e}
\end{aligned}$$

Mathematica [A] time = 0.03, size = 68, normalized size = 0.94

$$\frac{\log\left(\frac{d+ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)^2}{e}-\frac{2bn\left(bn\text{Li}_3\left(-\frac{ex}{d}\right)-\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)\right)}{e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(d + e*x),x]
```

```
[Out] ((a + b*Log[c*x^n])^2*Log[(d + e*x)/d])/e - (2*b*n*(-((a + b*Log[c*x^n])*Po
lyLog[2, -((e*x)/d)]) + b*n*PolyLog[3, -((e*x)/d)]))/e
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\log\left(cx^n\right)^2+2\,ab\log\left(cx^n\right)+a^2}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e*x + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^2}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/(e*x + d), x)
```

maple [C] time = 0.36, size = 1412, normalized size = 19.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/(e*x+d),x)
```

```
[Out] b^2*n^2/e*ln(x)^2*ln(1+1/d*e*x)+2*b^2*n^2/e*ln(x)*polylog(2,-1/d*e*x)-2*b^2
*n^2*dilog((e*x+d)/d)/e*ln(x)-2*b^2*n^2*ln(x)^2*ln((e*x+d)/d)/e+b^2*ln(e*x+
d)/e*n^2*ln(x)^2+I*ln(e*x+d)/e*ln(c)*Pi*b^2*csgn(I*c*x^n)^2*csgn(I*c)+I*ln(
e*x+d)/e*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)^2-2*b^2*ln(e*x+d)/e*ln(x)*l
n(x^n)*n+2*b^2*n*ln(x)*ln((e*x+d)/d)/e*ln(x^n)+1/2*ln(e*x+d)/e*Pi^2*b^2*csg
n(I*c*x^n)^5*csgn(I*c)-1/4*ln(e*x+d)/e*Pi^2*b^2*csgn(I*c*x^n)^4*csgn(I*c)^2
+1/2*ln(e*x+d)/e*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^5-I/e*n*ln(e*x+d)*ln(-1
/d*e*x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/e*n*ln(e*x+d)*ln(-1/d*e*x)*b^2
*Pi*csgn(I*c*x^n)^2*csgn(I*c)-I*ln(e*x+d)/e*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)+I/e*n*dilog(-1/d*e*x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)-I*ln(e*x+d)/e*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2/e*n*ln(e
*x+d)*ln(-1/d*e*x)*b^2*ln(c)-1/4*ln(e*x+d)/e*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*
c*x^n)^4+ln(e*x+d)/e*ln(c)^2*b^2+b^2*ln(e*x+d)/e*ln(x^n)^2+a^2*ln(e*x+d)/e+
I/e*n*dilog(-1/d*e*x)*b^2*Pi*csgn(I*c*x^n)^3-2*b/e*n*dilog(-1/d*e*x)*a-2*b/
e*n*ln(e*x+d)*ln(-1/d*e*x)*a+I/e*n*ln(e*x+d)*ln(-1/d*e*x)*b^2*Pi*csgn(I*c*x
^n)^3-I/e*n*dilog(-1/d*e*x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+I*ln(e*x+d)/e*
ln(x^n)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-I/e*n*dilog(-1/d*e*x)*b^2*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2+I*ln(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^
n)^2+I*ln(e*x+d)/e*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n)^2+I*ln(e*x+d)/e*Pi*a*b*
```

```
csgn(I*c*x^n)^2*csgn(I*c)+I/e*n*ln(e*x+d)*ln(-1/d*e*x)*b^2*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)-2/e*n*dilog(-1/d*e*x)*b^2*ln(c)+2*ln(e*x+d)/e*ln(c)*
a*b-I*ln(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*b^2*
n*dilog((e*x+d)/d)/e*ln(x^n)-1/4*ln(e*x+d)/e*Pi^2*b^2*csgn(I*c*x^n)^6+2*ln(
e*x+d)/e*ln(x^n)*b^2*ln(c)+2*b*ln(e*x+d)/e*ln(x^n)*a-I*ln(e*x+d)/e*ln(c)*Pi
*b^2*csgn(I*c*x^n)^3-2*b^2*n^2*polylog(3,-1/d*e*x)/e-ln(e*x+d)/e*Pi^2*b^2*c
sgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/2*ln(e*x+d)/e*Pi^2*b^2*csgn(I*x^n)^2
*csgn(I*c*x^n)^3*csgn(I*c)+1/2*ln(e*x+d)/e*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^
n)^3*csgn(I*c)^2-1/4*ln(e*x+d)/e*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csg
n(I*c)^2-I*ln(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^3-I*ln(e*x+d)/e*Pi*a*b*
csgn(I*c*x^n)^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{a^2 \log(ex+d)}{e} + \int \frac{b^2 \log(c)^2 + b^2 \log(x^n)^2 + 2\,ab\log(c) + 2\left(b^2 \log(c) + ab\right)\log(x^n)}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] a^2*log(e*x + d)/e + integrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c
) + 2*(b^2*log(c) + a*b)*log(x^n))/(e*x + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b\,\ln(c\,x^n))^2}{d + e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(d + e*x),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b\log(cx^n)\right)^2}{d + ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/(e*x+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(d + e*x), x)
```

3.96 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex)}\,dx$

Optimal. Leaf size=79

$$\frac{2bn\text{Li}_2\left(-\frac{d}{ex}\right)\left(a+b\log\left(cx^n\right)\right)}{d}-\frac{\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{d}+\frac{2b^2n^2\text{Li}_3\left(-\frac{d}{ex}\right)}{d}$$

```
[Out] -ln(1+d/e/x)*(a+b*ln(c*x^n))^2/d+2*b*n*(a+b*ln(c*x^n))*polylog(2,-d/e/x)/d+
2*b^2*n^2*polylog(3,-d/e/x)/d
```

Rubi [A] time = 0.16, antiderivative size = 98, normalized size of antiderivative = 1.24, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2344, 2302, 30, 2317, 2374, 6589}

$$-\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d}-\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{d}+\frac{\left(a+b\log\left(cx\right.\right.}{3bdn}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x)),x]
```

```
[Out] (a + b*Log[c*x^n])^3/(3*b*d*n) - ((a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d
- (2*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d + (2*b^2*n^2*PolyLog[
3, -((e*x)/d)])/d
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x(d+ex)}\,dx = \frac{\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx}{d} - \frac{e\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx}{d}$$

$$= -\frac{\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{d} + \frac{\operatorname{Subst}\left(\int x^2\,dx, x, a+b\log\left(cx^n\right)\right)}{bdn} + \frac{(2bn)\int \frac{(a+\cdots}{\cdots}}{\cdots}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^3}{3bdn} - \frac{\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{d} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)\operatorname{Li}_2\left(-\frac{ex}{d}\cdots\right.}{d}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^3}{3bdn} - \frac{\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{d} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)\operatorname{Li}_2\left(-\frac{ex}{d}\cdots\right.}{d}$$

Mathematica [A] time = 0.07, size = 94, normalized size = 1.19

$$-\frac{2bn\left(\operatorname{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\operatorname{Li}_3\left(-\frac{ex}{d}\right)\right)}{d}-\frac{\log\left(\frac{d+ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)^2}{d}+\frac{\left(a+b\log\left(cx^n\right)\right)^3}{3bdn}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x)),x]
```

```
[Out] (a + b*Log[c*x^n])^3/(3*b*d*n) - ((a + b*Log[c*x^n])^2*Log[(d + e*x)/d])/d
- (2*b*n*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x
)/d)]))/d
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{b^2\log\left(cx^n\right)^2+2\,ab\log\left(cx^n\right)+a^2}{ex^2+dx}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e*x^2 + d*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2}{(ex+d)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)*x), x)
```

maple [C] time = 0.47, size = 2315, normalized size = 29.30

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x/(e*x+d),x)
```

```
[Out] b^2*ln(x^n)^2/d*ln(x)-b^2/d*ln(e*x+d)*ln(x^n)^2-b^2/d*ln(e*x+d)*n^2*ln(x)^2
-b^2*n^2/d*ln(x)^2*ln(1/d*e*x+1)-2*b^2*n^2/d*ln(x)*polylog(2,-1/d*e*x)+2*b^
2*n^2/d*dilog((e*x+d)/d)*ln(x)+2*b^2*n^2/d*ln(x)^2*ln((e*x+d)/d)+I*ln(x^n)/
d*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/d*ln(x)*ln(c)^2*b^2-1/d*ln(e*x+d
)*ln(c)^2*b^2+1/3*b^2*n^2/d*ln(x)^3+2*b^2*n^2/d*polylog(3,-1/d*e*x)-a^2/d*l
n(e*x+d)+a^2/d*ln(x)-I*n/d*ln(e*x+d)*ln(-1/d*e*x)*b^2*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)+I*ln(x^n)/d*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/d*
ln(x)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*n*ln(x)^2/d*b^
2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4/d*ln(x)*Pi^2*b^2*csgn(I*c*x^n)
^6+1/4/d*ln(e*x+d)*Pi^2*b^2*csgn(I*c*x^n)^6-b^2/d*ln(x)^2*ln(x^n)*n+2*ln(x^
n)/d*ln(x)*b^2*ln(c)-2/d*ln(e*x+d)*ln(x^n)*b^2*ln(c)-I/d*ln(x)*Pi*a*b*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/d*ln(e*x+d)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)+I/d*ln(e*x+d)*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)-I*n/d*dilog(-1/d*e*x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I
*n/d*ln(e*x+d)*ln(-1/d*e*x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-I*ln(x^n)/d*ln
(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/d*ln(e*x+d)*Pi*a*b*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-I/d*ln(e*x+d)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*
c*x^n)^2-I/d*ln(e*x+d)*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n)^2-I/d*ln(e*x+d)*ln(
c)*Pi*b^2*csgn(I*c*x^n)^2*csgn(I*c)+2*b*n/d*ln(e*x+d)*ln(-1/d*e*x)*a+2*n/d*
ln(e*x+d)*ln(-1/d*e*x)*b^2*ln(c)+2*b*ln(x^n)/d*ln(x)*a+I/d*ln(e*x+d)*ln(x^n
)*b^2*Pi*csgn(I*c*x^n)^3-1/4/d*ln(x)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2
*csgn(I*c)^2+1/2/d*ln(x)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+I
/d*ln(e*x+d)*ln(c)*Pi*b^2*csgn(I*c*x^n)^3+I/d*ln(e*x+d)*Pi*a*b*csgn(I*c*x^n
)^3+1/4/d*ln(e*x+d)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/d*
ln(x)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/2/d*ln(x)*Pi^2*b^2*c
sgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-1/2/d*ln(e*x+d)*Pi^2*b^2*csgn(I*x^n)
*csgn(I*c*x^n)^3*csgn(I*c)^2-1/2/d*ln(e*x+d)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*
c*x^n)^3*csgn(I*c)-I*ln(x^n)/d*ln(x)*b^2*Pi*csgn(I*c*x^n)^3+1/d*ln(e*x+d)*P
i^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)-I*n/d*dilog(-1/d*e*x)*b^2*Pi*
csgn(I*c*x^n)^3+1/2*I*n*ln(x)^2/d*b^2*Pi*csgn(I*c*x^n)^3-I/d*ln(x)*ln(c)*Pi
*b^2*csgn(I*c*x^n)^3-I/d*ln(x)*Pi*a*b*csgn(I*c*x^n)^3+I*n/d*ln(e*x+d)*ln(-1
/d*e*x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*n/d*dilog(-1/d*e*x)*b^2*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2+I*n/d*dilog(-1/d*e*x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(
I*c)+I/d*ln(x)*Pi*a*b*csgn(I*c*x^n)^2*csgn(I*c)-I/d*ln(e*x+d)*Pi*a*b*csgn(I
*c*x^n)^2*csgn(I*c)-2*b/d*ln(e*x+d)*ln(x^n)*a-I/d*ln(e*x+d)*ln(x^n)*b^2*Pi*
csgn(I*x^n)*csgn(I*c*x^n)^2-2/d*ln(e*x+d)*ln(c)*a*b-n*ln(x)^2/d*b^2*ln(c)+2
*n/d*dilog(-1/d*e*x)*b^2*ln(c)+2/d*ln(x)*ln(c)*a*b-I*n/d*ln(e*x+d)*ln(-1/d*
e*x)*b^2*Pi*csgn(I*c*x^n)^3+I/d*ln(x)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n
)^2-1/2*I*n*ln(x)^2/d*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+I/d*ln(x)*Pi*a*b*csg
n(I*x^n)*csgn(I*c*x^n)^2+I/d*ln(x)*ln(c)*Pi*b^2*csgn(I*c*x^n)^2*csgn(I*c)-2
*b^2*n/d*dilog((e*x+d)/d)*ln(x^n)+1/2/d*ln(x)*Pi^2*b^2*csgn(I*c*x^n)^5*csgn
(I*c)-1/4/d*ln(x)*Pi^2*b^2*csgn(I*c*x^n)^4*csgn(I*c)^2+1/4/d*ln(e*x+d)*Pi^2
*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4-1/2/d*ln(e*x+d)*Pi^2*b^2*csgn(I*x^n)*csg
n(I*c*x^n)^5-1/2*I*n*ln(x)^2/d*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/d*ln(e*
x+d)*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-b*n*ln(x)^2/d*a+2*b*n/d*dilog
(-1/d*e*x)*a+2*b^2/d*ln(e*x+d)*ln(x)*ln(x^n)*n-2*b^2*n/d*ln(x)*ln((e*x+d)/d
)*ln(x^n)-1/2/d*ln(e*x+d)*Pi^2*b^2*csgn(I*c*x^n)^5*csgn(I*c)+1/4/d*ln(e*x+d
)*Pi^2*b^2*csgn(I*c*x^n)^4*csgn(I*c)^2-1/4/d*ln(x)*Pi^2*b^2*csgn(I*x^n)^2*c
sgn(I*c*x^n)^4+1/2/d*ln(x)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^5
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^2\left(\frac{\log(ex+d)}{d}-\frac{\log(x)}{d}\right)+\int\frac{b^2\log(c)^2+b^2\log(x^n)^2+2\,ab\log(c)+2\left(b^2\log(c)+ab\right)\log(x^n)}{ex^2+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d),x, algorithm="maxima")
```

```
[Out] -a^2*(log(e*x + d)/d - log(x)/d) + integrate((b^2*log(c)^2 + b^2*log(x^n)^2
 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e*x^2 + d*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\ \ln(c\,x^n))^2}{x\ (d+e\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x*(d + e*x)),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(x*(d + e*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^{n}\right)\right)^{2}}{x\left(d+ex\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(e*x+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x*(d + e*x)), x)
```

3.97 $\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)} dx$

Optimal. Leaf size=135

$$-\frac{2benLi_2\left(-\frac{d}{ex}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}+\frac{e\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{d^2}-\frac{2bn\left(a+b\log\left(cx^n\right)\right)}{dx}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{dx}-\frac{2b}{}$$

```
[Out] -2*b^2*n^2/d/x-2*b*n*(a+b*ln(c*x^n))/d/x-(a+b*ln(c*x^n))^2/d/x+e*ln(1+d/e/x
)*(a+b*ln(c*x^n))^2/d^2-2*b*e*n*(a+b*ln(c*x^n))*polylog(2,-d/e/x)/d^2-2*b^2
*e*n^2*polylog(3,-d/e/x)/d^2
```

Rubi [A] time = 0.24, antiderivative size = 155, normalized size of antiderivative = 1.15, number of steps used = 9, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2353, 2305, 2304, 2302, 30, 2317, 2374, 6589}

$$\frac{2benPolyLog\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}-\frac{2b^2en^2PolyLog\left(3,-\frac{ex}{d}\right)}{d^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^3}{3bd^2n}+\frac{e\log\left(\frac{ex}{d}+1\right)\left(a+b\log\right.}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)),x]
```

```
[Out] (-2*b^2*n^2)/(d*x) - (2*b*n*(a + b*Log[c*x^n]))/(d*x) - (a + b*Log[c*x^n])^
2/(d*x) - (e*(a + b*Log[c*x^n])^3)/(3*b*d^2*n) + (e*(a + b*Log[c*x^n])^2*Lo
g[1 + (e*x)/d])/d^2 + (2*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d
^2 - (2*b^2*e*n^2*PolyLog[3, -((e*x)/d)])/d^2
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2(d+ex)}\,dx = \int \left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{dx^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{d^2x}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{d^2(d+ex)}\right)dx$$

$$=\frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{x^2}\,dx}{d}-\frac{e\int \frac{\left(a+b\log(cx^n)\right)^2}{x}\,dx}{d^2}+\frac{e^2\int \frac{\left(a+b\log(cx^n)\right)^2}{d+ex}\,dx}{d^2}$$

$$=-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{dx}+\frac{e\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{d^2}-\frac{e\,\mathrm{Subst}\left(\int x^2\,dx,x,a+b\log\left(cx^n\right)\right)}{bd^2n}$$

$$=-\frac{2b^2n^2}{dx}-\frac{2bn\left(a+b\log\left(cx^n\right)\right)}{dx}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{dx}-\frac{e\left(a+b\log\left(cx^n\right)\right)^3}{3bd^2n}+\frac{e\left(a+\right.}{}$$

$$=-\frac{2b^2n^2}{dx}-\frac{2bn\left(a+b\log\left(cx^n\right)\right)}{dx}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{dx}-\frac{e\left(a+b\log\left(cx^n\right)\right)^3}{3bd^2n}+\frac{e\left(a+\right.}{}$$

Mathematica [A] time = 0.12, size = 130, normalized size = 0.96

$$-\frac{-6ben\left(\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\mathrm{Li}_3\left(-\frac{ex}{d}\right)\right)-3e\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2+\frac{3d\left(a+b\log(cx^n)\right)^2}{x}+\frac{6bdn}{}}{3d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)),x]
```

```
[Out] -1/3*((3*d*(a + b*Log[c*x^n])^2)/x + (e*(a + b*Log[c*x^n])^3)/(b*n) + (6*b*
d*n*(a + b*n + b*Log[c*x^n]))/x - 3*e*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d]
 - 6*b*e*n*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e
*x)/d)]))/d^2
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2\log\left(cx^n\right)^2+2\,ab\log\left(cx^n\right)+a^2}{ex^3+dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e*x^3 + d*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log\left(cx^{n}\right) + a\right)^{2}}{(ex + d)x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)*x^2), x)
```

maple [F] time = 0.71, size = 0, normalized size = 0.00

$$\int \frac{(b \ln(c\, x^{n}) + a)^{2}}{(ex + d)\, x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x^2/(e*x+d),x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/x^2/(e*x+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a^{2}\left(\frac{e \log(ex + d)}{d^{2}} - \frac{e \log(x)}{d^{2}} - \frac{1}{dx}\right) + \int \frac{b^{2} \log(c)^{2} + b^{2} \log\left(x^{n}\right)^{2} + 2\, ab \log(c) + 2\left(b^{2} \log(c) + ab\right) \log\left(x^{n}\right)}{ex^{3} + dx^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] a^2*(e*log(e*x + d)/d^2 - e*log(x)/d^2 - 1/(d*x)) + integrate((b^2*log(c)^2
 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e*x^3 +
d*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b\, \ln(c\, x^{n}))^{2}}{x^{2}\, (d + e\, x)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x^2*(d + e*x)),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(x^2*(d + e*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \log\left(cx^{n}\right)\right)^{2}}{x^{2}\,(d + ex)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**2/(e*x+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x**2*(d + e*x)), x)
```

3.98 $\int \frac{\left(a+b\log(cx^n)\right)^2}{x^3(d+ex)}\,dx$

Optimal. Leaf size=204

$$\frac{2be^2n\text{Li}_2\left(-\frac{d}{ex}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{e^2\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{d^3}+\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{d^2x}+\frac{2ben\left(a+b\log\left(cx^n\right)\right)}{d^2x}$$

```
[Out] -1/4*b^2*n^2/d/x^2+2*b^2*e*n^2/d^2/x-1/2*b*n*(a+b*ln(c*x^n))/d/x^2+2*b*e*n*
(a+b*ln(c*x^n))/d^2/x-1/2*(a+b*ln(c*x^n))^2/d/x^2+e*(a+b*ln(c*x^n))^2/d^2/x
-e^2*ln(1+d/e/x)*(a+b*ln(c*x^n))^2/d^3+2*b*e^2*n*(a+b*ln(c*x^n))*polylog(2,
-d/e/x)/d^3+2*b^2*e^2*n^2*polylog(3,-d/e/x)/d^3
```

Rubi [A] time = 0.29, antiderivative size = 226, normalized size of antiderivative = 1.11, number of steps used = 11, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2353, 2305, 2304, 2302, 30, 2317, 2374, 6589}

$$-\frac{2be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{2b^2e^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^3}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^3}{3bd^3n}-\frac{e^2\log\left(\frac{ex}{d}+1\right)\left(a\right.}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x^3*(d + e*x)),x]
```

```
[Out] -(b^2*n^2)/(4*d*x^2) + (2*b^2*e*n^2)/(d^2*x) - (b*n*(a + b*Log[c*x^n]))/(2*
d*x^2) + (2*b*e*n*(a + b*Log[c*x^n]))/(d^2*x) - (a + b*Log[c*x^n])^2/(2*d*x
^2) + (e*(a + b*Log[c*x^n])^2)/(d^2*x) + (e^2*(a + b*Log[c*x^n])^3)/(3*b*d^
3*n) - (e^2*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d^3 - (2*b*e^2*n*(a + b*
Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^3 + (2*b^2*e^2*n^2*PolyLog[3, -((e*x)
/d)])/d^3
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
```

```
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^3(d+ex)}\,dx = \int \left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{dx^3} - \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{d^2x^2} + \frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{d^3x} - \frac{e^3\left(a+b\log\left(cx\right.\right.}{d^3(d+ex)}\right.$$

$$= \frac{\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^3}\,dx}{d} - \frac{e\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\,dx}{d^2} + \frac{e^2\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx}{d^3} - \frac{e^3\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx}{d^3}$$

$$= -\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2dx^2} + \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{d^2x} - \frac{e^2\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{d^3} + \frac{e^2\,\mathrm{Sub}}{}$$

$$= -\frac{b^2n^2}{4dx^2} + \frac{2b^2en^2}{d^2x} - \frac{bn\left(a+b\log\left(cx^n\right)\right)}{2dx^2} + \frac{2ben\left(a+b\log\left(cx^n\right)\right)}{d^2x} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2dx^2}$$

$$= -\frac{b^2n^2}{4dx^2} + \frac{2b^2en^2}{d^2x} - \frac{bn\left(a+b\log\left(cx^n\right)\right)}{2dx^2} + \frac{2ben\left(a+b\log\left(cx^n\right)\right)}{d^2x} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2dx^2}$$

Mathematica [A] time = 0.14, size = 185, normalized size = 0.91

$$\frac{-\frac{6d^2\left(a+b\log\left(cx^n\right)\right)^2}{x^2} - \frac{3bd^2n\left(2a+2b\log\left(cx^n\right)+bn\right)}{x^2} - 24be^2n\left(\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right) - bn\mathrm{Li}_3\left(-\frac{ex}{d}\right)\right) - 12e^2\log\left(\frac{ex}{d}+1\right)}{12d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x^3*(d + e*x)),x]
```

```
[Out] ((-6*d^2*(a + b*Log[c*x^n])^2)/x^2 + (12*d*e*(a + b*Log[c*x^n])^2)/x + (4*e
^2*(a + b*Log[c*x^n])^3)/(b*n) + (24*b*d*e*n*(a + b*n + b*Log[c*x^n]))/x -
(3*b*d^2*n*(2*a + b*n + 2*b*Log[c*x^n]))/x^2 - 12*e^2*(a + b*Log[c*x^n])^2*
Log[1 + (e*x)/d] - 24*b*e^2*n*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] -
b*n*PolyLog[3, -((e*x)/d)]))/(12*d^3)
```

fricas [F] time = 0.80, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2 \log\left(cx^n\right)^2 + 2\,ab\log\left(cx^n\right) + a^2}{ex^4 + dx^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^3/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e*x^4 + d*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right) + a\right)^2}{(ex+d)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^3/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)*x^3), x)
```

maple [F] time = 0.75, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right) + a\right)^2}{(ex+d)\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x^3/(e*x+d),x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/x^3/(e*x+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a^2\left(\frac{2\,e^2\log\left(ex+d\right)}{d^3} - \frac{2\,e^2\log(x)}{d^3} - \frac{2\,ex-d}{d^2x^2}\right) + \int \frac{b^2\log(c)^2 + b^2\log\left(x^n\right)^2 + 2\,ab\log(c) + 2\left(b^2\log(c) + ab\right)\log\left(x^n\right)}{ex^4 + dx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^3/(e*x+d),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(2*e^2*log(e*x + d)/d^3 - 2*e^2*log(x)/d^3 - (2*e*x - d)/(d^2*x^2)
) + integrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c)
 + a*b)*log(x^n))/(e*x^4 + d*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a + b\,\ln\left(c\,x^n\right)\right)^2}{x^3\,\left(d + e\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x^3*(d + e*x)),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(x^3*(d + e*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b\log\left(cx^n\right)\right)^2}{x^3\left(d + ex\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**3/(e*x+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x**3*(d + e*x)), x)
```

3.99 $\int \frac{(a+b\log(cx^n))^2}{x^4(d+ex)}\,dx$

Optimal. Leaf size=273

$$-\frac{2be^3n\mathrm{Li}_2\left(-\frac{d}{ex}\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}+\frac{e^3\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{d^4}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{d^3x}-\frac{2be^2n\left(a+b\log\left(cx^n\right.\right.}{d^3x}$$

```
[Out] -2/27*b^2*n^2/d/x^3+1/4*b^2*e*n^2/d^2/x^2-2*b^2*e^2*n^2/d^3/x-2/9*b*n*(a+b*
ln(c*x^n))/d/x^3+1/2*b*e*n*(a+b*ln(c*x^n))/d^2/x^2-2*b*e^2*n*(a+b*ln(c*x^n)
)/d^3/x-1/3*(a+b*ln(c*x^n))^2/d/x^3+1/2*e*(a+b*ln(c*x^n))^2/d^2/x^2-e^2*(a+
b*ln(c*x^n))^2/d^3/x+e^3*ln(1+d/e/x)*(a+b*ln(c*x^n))^2/d^4-2*b*e^3*n*(a+b*l
n(c*x^n))*polylog(2,-d/e/x)/d^4-2*b^2*e^3*n^2*polylog(3,-d/e/x)/d^4
```

Rubi [A] time = 0.36, antiderivative size = 295, normalized size of antiderivative = 1.08, number of steps used = 13, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2353, 2305, 2304, 2302, 30, 2317, 2374, 6589}

$$\frac{2be^3n\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{2b^2e^3n^2\mathrm{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^4}-\frac{e^3\left(a+b\log\left(cx^n\right)\right)^3}{3bd^4n}+\frac{e^3\log\left(\frac{ex}{d}+1\right)\left(a+b\right.}{d^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x^4*(d + e*x)),x]
```

```
[Out] (-2*b^2*n^2)/(27*d*x^3) + (b^2*e*n^2)/(4*d^2*x^2) - (2*b^2*e^2*n^2)/(d^3*x)
 - (2*b*n*(a + b*Log[c*x^n]))/(9*d*x^3) + (b*e*n*(a + b*Log[c*x^n]))/(2*d^2
*x^2) - (2*b*e^2*n*(a + b*Log[c*x^n]))/(d^3*x) - (a + b*Log[c*x^n])^2/(3*d*
x^3) + (e*(a + b*Log[c*x^n])^2)/(2*d^2*x^2) - (e^2*(a + b*Log[c*x^n])^2)/(d
^3*x) - (e^3*(a + b*Log[c*x^n])^3)/(3*b*d^4*n) + (e^3*(a + b*Log[c*x^n])^2*
Log[1 + (e*x)/d])/d^4 + (2*b*e^3*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)
])/d^4 - (2*b^2*e^3*n^2*PolyLog[3, -((e*x)/d)])/d^4
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^4(d+ex)}\,dx = \int \left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{dx^4} - \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{d^2x^3} + \frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{d^3x^2} - \frac{e^3\left(a+b\log\right.}{d^4x}\right.$$

$$= \frac{\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^4}\,dx}{d} - \frac{e\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^3}\,dx}{d^2} + \frac{e^2\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\,dx}{d^3} - \frac{e^3\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}}{d^4}$$

$$= -\frac{\left(a+b\log\left(cx^n\right)\right)^2}{3dx^3} + \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2d^2x^2} - \frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{d^3x} + \frac{e^3\left(a+b\log\left(cx\right.\right.}{}$$

$$= -\frac{2b^2n^2}{27dx^3} + \frac{b^2en^2}{4d^2x^2} - \frac{2b^2e^2n^2}{d^3x} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)}{9dx^3} + \frac{ben\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2} - \frac{2be^2}{}$$

$$= -\frac{2b^2n^2}{27dx^3} + \frac{b^2en^2}{4d^2x^2} - \frac{2b^2e^2n^2}{d^3x} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)}{9dx^3} + \frac{ben\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2} - \frac{2be^2}{}$$

Mathematica [A] time = 0.14, size = 237, normalized size = 0.87

$$\frac{-\frac{36d^3\left(a+b\log\left(cx^n\right)\right)^2}{x^3} - \frac{8bd^3n\left(3a+3b\log\left(cx^n\right)+bn\right)}{x^3} + \frac{54d^2e\left(a+b\log\left(cx^n\right)\right)^2}{x^2} + \frac{27bd^2en\left(2a+2b\log\left(cx^n\right)+bn\right)}{x^2} + 216be^3n\left(\text{Li}_2\left(-\frac{ex}{d}\right)\left(a\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x^4*(d + e*x)),x]
```

```
[Out] ((-36*d^3*(a + b*Log[c*x^n])^2)/x^3 + (54*d^2*e*(a + b*Log[c*x^n])^2)/x^2 -
 (108*d*e^2*(a + b*Log[c*x^n])^2)/x - (36*e^3*(a + b*Log[c*x^n])^3)/(b*n) -
 (216*b*d*e^2*n*(a + b*n + b*Log[c*x^n]))/x + (27*b*d^2*e*n*(2*a + b*n + 2*
```

```
b*Log[c*x^n]))/x^2 - (8*b*d^3*n*(3*a + b*n + 3*b*Log[c*x^n]))/x^3 + 108*e^3
*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 216*b*e^3*n*((a + b*Log[c*x^n])*Po
lyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x)/d)]))/(108*d^4)
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2 \log\left(cx^n\right)^2 + 2\,ab\log\left(cx^n\right) + a^2}{ex^5 + dx^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^4/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e*x^5 + d*x^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right) + a\right)^2}{(ex + d)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^4/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)*x^4), x)
```

maple [F] time = 0.77, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right) + a\right)^2}{(ex + d)\,x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x^4/(e*x+d),x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/x^4/(e*x+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{6}\,a^2\left(\frac{6\,e^3\log\left(ex + d\right)}{d^4} - \frac{6\,e^3\log(x)}{d^4} - \frac{6\,e^2x^2 - 3\,dex + 2\,d^2}{d^3x^3}\right) + \int \frac{b^2\log(c)^2 + b^2\log\left(x^n\right)^2 + 2\,ab\log(c) + 2\left(b^2\log\right.}{ex^5 + dx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^4/(e*x+d),x, algorithm="maxima")
```

```
[Out] 1/6*a^2*(6*e^3*log(e*x + d)/d^4 - 6*e^3*log(x)/d^4 - (6*e^2*x^2 - 3*d*e*x +
 2*d^2)/(d^3*x^3)) + integrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c
) + 2*(b^2*log(c) + a*b)*log(x^n))/(e*x^5 + d*x^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a + b\,\ln\left(c\,x^n\right)\right)^2}{x^4\,\left(d + e\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x^4*(d + e*x)),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(x^4*(d + e*x)), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^{n}\right)\right)^{2}}{x^{4}\left(d+ex\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**4/(e*x+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x**4*(d + e*x)), x)
```

3.100 $\int \frac{x^3\left(a+b\log(cx^n)\right)^2}{(d+ex)^2}\,dx$

Optimal. Leaf size=281

$$\frac{6bd^2n\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2bd^2n\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{3d^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e^4}-\frac{d^2x\left(\right.}{}$$

```
[Out] 4*a*b*d*n*x/e^3-4*b^2*d*n^2*x/e^3+1/4*b^2*n^2*x^2/e^2+4*b^2*d*n*x*ln(c*x^n)
/e^3-1/2*b*n*x^2*(a+b*ln(c*x^n))/e^2-2*d*x*(a+b*ln(c*x^n))^2/e^3+1/2*x^2*(a
+b*ln(c*x^n))^2/e^2-d^2*x*(a+b*ln(c*x^n))^2/e^3/(e*x+d)+2*b*d^2*n*(a+b*ln(c
*x^n))*ln(1+e*x/d)/e^4+3*d^2*(a+b*ln(c*x^n))^2*ln(1+e*x/d)/e^4+2*b^2*d^2*n^
2*polylog(2,-e*x/d)/e^4+6*b*d^2*n*(a+b*ln(c*x^n))*polylog(2,-e*x/d)/e^4-6*b
^2*d^2*n^2*polylog(3,-e*x/d)/e^4
```

Rubi [A] time = 0.31, antiderivative size = 281, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2353, 2296, 2295, 2305, 2304, 2318, 2317, 2391, 2374, 6589}

$$\frac{6bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2b^2d^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}-\frac{6b^2d^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}+\frac{2bd^2n\log\left(\frac{ex}{d}+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```

```
[Out] (4*a*b*d*n*x)/e^3 - (4*b^2*d*n^2*x)/e^3 + (b^2*n^2*x^2)/(4*e^2) + (4*b^2*d*
n*x*Log[c*x^n])/e^3 - (b*n*x^2*(a + b*Log[c*x^n]))/(2*e^2) - (2*d*x*(a + b*
Log[c*x^n])^2)/e^3 + (x^2*(a + b*Log[c*x^n])^2)/(2*e^2) - (d^2*x*(a + b*Log
[c*x^n])^2)/(e^3*(d + e*x)) + (2*b*d^2*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d
])/e^4 + (3*d^2*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^4 + (2*b^2*d^2*n^2
*PolyLog[2, -((e*x)/d)])/e^4 + (6*b*d^2*n*(a + b*Log[c*x^n])*PolyLog[2, -((
e*x)/d)])/e^4 - (6*b^2*d^2*n^2*PolyLog[3, -((e*x)/d)])/e^4
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3 \left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}\,dx = \int \left(-\frac{2d\left(a+b\log\left(cx^n\right)\right)^2}{e^3}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e^2}-\frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)^2}+\frac{3d^2\left(a+\right.}{e^3(}\right.$$

$$=-\frac{(2d)\int\left(a+b\log\left(cx^n\right)\right)^2dx}{e^3}+\frac{\left(3d^2\right)\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}dx}{e^3}-\frac{d^3\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}dx}{e^3}+\int$$

$$=-\frac{2dx\left(a+b\log\left(cx^n\right)\right)^2}{e^3}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^2}-\frac{d^2x\left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)}+\frac{3d^2\left(a+\right.}{}$$

$$=\frac{4abdnx}{e^3}+\frac{b^2n^2x^2}{4e^2}-\frac{bnx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}-\frac{2dx\left(a+b\log\left(cx^n\right)\right)^2}{e^3}+\frac{x^2\left(a+b\log\right.}{2e^2}$$

$$=\frac{4abdnx}{e^3}-\frac{4b^2dn^2x}{e^3}+\frac{b^2n^2x^2}{4e^2}+\frac{4b^2dnx\log\left(cx^n\right)}{e^3}-\frac{bnx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}-\frac{2dx\left(a\right.}{}$$

Mathematica [A] time = 0.20, size = 240, normalized size = 0.85

$$\frac{4d^2\left(2b^2n^2\text{Li}_2\left(-\frac{ex}{d}\right)-\left(a+b\log\left(cx^n\right)\right)\left(a+b\log\left(cx^n\right)-2bn\log\left(\frac{ex}{d}+1\right)\right)\right)+\frac{4d^3\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}+24bd^2n\left(\text{Li}_2\left(-\frac{ex}{d}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```

```
[Out] (-8*d*e*x*(a + b*Log[c*x^n])^2 + 2*e^2*x^2*(a + b*Log[c*x^n])^2 + (4*d^3*(a
 + b*Log[c*x^n])^2)/(d + e*x) + 16*b*d*e*n*x*(a - b*n + b*Log[c*x^n]) + b*e
^2*n*x^2*(b*n - 2*(a + b*Log[c*x^n])) + 12*d^2*(a + b*Log[c*x^n])^2*Log[1 +
 (e*x)/d] + 4*d^2*(-((a + b*Log[c*x^n])*(a + b*Log[c*x^n] - 2*b*n*Log[1 + (
e*x)/d])) + 2*b^2*n^2*PolyLog[2, -((e*x)/d)]) + 24*b*d^2*n*((a + b*Log[c*x^
n])*PolyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x)/d)]))/(4*e^4)
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^3\log\left(cx^n\right)^2+2\,abx^3\log\left(cx^n\right)+a^2x^3}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*log(c*x^n)^2 + 2*a*b*x^3*log(c*x^n) + a^2*x^3)/(e^2*x^2 +
 2*d*e*x + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2x^3}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^3/(e*x + d)^2, x)
```

maple [F] time = 0.69, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)^2x^3}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)^2/(e*x+d)^2,x)
```

```
[Out] int(x^3*(b*ln(c*x^n)+a)^2/(e*x+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\left(\frac{2\,d^3}{e^5x+de^4}+\frac{6\,d^2\log\left(ex+d\right)}{e^4}+\frac{ex^2-4\,dx}{e^3}\right)a^2+\int\frac{b^2x^3\log\left(x^n\right)^2+2\left(b^2\log(c)+ab\right)x^3\log\left(x^n\right)+\left(b^2\log(c\right.}{e^2x^2+2\,dex+d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(2*d^3/(e^5*x + d*e^4) + 6*d^2*log(e*x + d)/e^4 + (e*x^2 - 4*d*x)/e^3)*
a^2 + integrate((b^2*x^3*log(x^n)^2 + 2*(b^2*log(c) + a*b)*x^3*log(x^n) + (
b^2*log(c)^2 + 2*a*b*log(c))*x^3)/(e^2*x^2 + 2*d*e*x + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^3\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2}{{\left(d+e\,x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n))^2)/(d + e*x)^2,x)
```

```
[Out] int((x^3*(a + b*log(c*x^n))^2)/(d + e*x)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^3\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))**2/(e*x+d)**2,x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))**2/(d + e*x)**2, x)
```

3.101 $\int \frac{x^2(a+b\log(cx^n))^2}{(d+ex)^2}\,dx$

Optimal. Leaf size=203

$$-\frac{4bdn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}-\frac{2bdn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}-\frac{2d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e^3}+\frac{dx\,(a+\cdots}{e^2\cdots}$$

```
[Out] -2*a*b*n*x/e^2+2*b^2*n^2*x/e^2-2*b^2*n*x*ln(c*x^n)/e^2+x*(a+b*ln(c*x^n))^2/
e^2+d*x*(a+b*ln(c*x^n))^2/e^2/(e*x+d)-2*b*d*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/e
^3-2*d*(a+b*ln(c*x^n))^2*ln(1+e*x/d)/e^3-2*b^2*d*n^2*polylog(2,-e*x/d)/e^3-
4*b*d*n*(a+b*ln(c*x^n))*polylog(2,-e*x/d)/e^3+4*b^2*d*n^2*polylog(3,-e*x/d)
/e^3
```

Rubi [A] time = 0.26, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {2353, 2296, 2295, 2318, 2317, 2391, 2374, 6589}

$$-\frac{4bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}-\frac{2b^2dn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}+\frac{4b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^3}-\frac{2bdn\log\left(\frac{ex}{d}+1\right)\cdots}{e\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```

```
[Out] (-2*a*b*n*x)/e^2 + (2*b^2*n^2*x)/e^2 - (2*b^2*n*x*Log[c*x^n])/e^2 + (x*(a +
 b*Log[c*x^n])^2)/e^2 + (d*x*(a + b*Log[c*x^n])^2)/(e^2*(d + e*x)) - (2*b*d
*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^3 - (2*d*(a + b*Log[c*x^n])^2*Log
[1 + (e*x)/d])/e^3 - (2*b^2*d*n^2*PolyLog[2, -((e*x)/d)])/e^3 - (4*b*d*n*(a
 + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^3 + (4*b^2*d*n^2*PolyLog[3, -((e
*x)/d)])/e^3
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}\,dx &= \int \left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{e^2}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)^2}-\frac{2d\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)}\right)dx\\
&= \frac{\int \left(a+b\log\left(cx^n\right)\right)^2\,dx}{e^2}-\frac{(2d)\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx}{e^2}+\frac{d^2\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}\,dx}{e^2}\\
&= \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e^2}+\frac{dx\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)}-\frac{2d\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{e^3}\\
&= -\frac{2abnx}{e^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e^2}+\frac{dx\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)}-\frac{2bdn\left(a+b\log\left(cx^n\right)\right)\mathrm{l}}{e^3}\\
&= -\frac{2abnx}{e^2}+\frac{2b^2n^2x}{e^2}-\frac{2b^2nx\log\left(cx^n\right)}{e^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e^2}+\frac{dx\left(a+b\log\left(cx^n\right.\right.}{e^2(d+ex)}
\end{aligned}$$

Mathematica [A] time = 0.16, size = 186, normalized size = 0.92

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}-4bdn\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)-2bdn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)-2d\log\left(\frac{ex}{d}+1\right)\left(a+b\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```

```
[Out] (d*(a + b*Log[c*x^n])^2 + e*x*(a + b*Log[c*x^n])^2 - (d^2*(a + b*Log[c*x^n]
)^2)/(d + e*x) - 2*b*e*n*x*(a - b*n + b*Log[c*x^n]) - 2*b*d*n*(a + b*Log[c*
x^n])*Log[1 + (e*x)/d] - 2*d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] - 2*b^2*
```

```
d*n^2*PolyLog[2, -((e*x)/d)] - 4*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x
)/d)] + 4*b^2*d*n^2*PolyLog[3, -((e*x)/d)])/e^3
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^2\log\left(cx^n\right)^2+2\,abx^2\log\left(cx^n\right)+a^2x^2}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*log(c*x^n)^2 + 2*a*b*x^2*log(c*x^n) + a^2*x^2)/(e^2*x^2 +
 2*d*e*x + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^2x^2}{\left(ex+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^2/(e*x + d)^2, x)
```

maple [F] time = 0.78, size = 0, normalized size = 0.00

$$\int\frac{\left(b\ln\left(c\,x^n\right)+a\right)^2x^2}{\left(ex+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)^2/(e*x+d)^2,x)
```

```
[Out] int(x^2*(b*ln(c*x^n)+a)^2/(e*x+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^2\left(\frac{d^2}{e^4x+de^3}-\frac{x}{e^2}+\frac{2\,d\log\left(ex+d\right)}{e^3}\right)+\int\frac{b^2x^2\log\left(x^n\right)^2+2\left(b^2\log(c)+ab\right)x^2\log\left(x^n\right)+\left(b^2\log(c)^2+2\,ab\log\right.}{e^2x^2+2\,dex+d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] -a^2*(d^2/(e^4*x + d*e^3) - x/e^2 + 2*d*log(e*x + d)/e^3) + integrate((b^2*
x^2*log(x^n)^2 + 2*(b^2*log(c) + a*b)*x^2*log(x^n) + (b^2*log(c)^2 + 2*a*b*
log(c))*x^2)/(e^2*x^2 + 2*d*e*x + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^2\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2}{{\left(d+e\,x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n))^2)/(d + e*x)^2,x)
```

```
[Out] int((x^2*(a + b*log(c*x^n))^2)/(d + e*x)^2, x)
```

sympy [**F**]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))**2/(e*x+d)**2,x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))**2/(d + e*x)**2, x)
```

3.102 $\int \frac{x\left(a+b\log(cx^n)\right)^2}{(d+ex)^2}\,dx$

Optimal. Leaf size=143

$$\frac{2bn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e^2}-\frac{x\left(a+b\log(c\right.}{e(d+ex}$$

```
[Out] -x*(a+b*ln(c*x^n))^2/e/(e*x+d)+2*b*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/e^2+(a+b*l
n(c*x^n))^2*ln(1+e*x/d)/e^2+2*b^2*n^2*polylog(2,-e*x/d)/e^2+2*b*n*(a+b*ln(c
*x^n))*polylog(2,-e*x/d)/e^2-2*b^2*n^2*polylog(3,-e*x/d)/e^2
```

Rubi [A] time = 0.20, antiderivative size = 143, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2353, 2318, 2317, 2391, 2374, 6589}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^2}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^2}+\frac{2bn\log\left(\frac{ex}{d}+1\right)\left(a+\right.}{e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```

```
[Out] -((x*(a + b*Log[c*x^n])^2)/(e*(d + e*x))) + (2*b*n*(a + b*Log[c*x^n])*Log[1
 + (e*x)/d])/e^2 + ((a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^2 + (2*b^2*n^2
*PolyLog[2, -((e*x)/d)])/e^2 + (2*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)
/d)])/e^2 - (2*b^2*n^2*PolyLog[3, -((e*x)/d)])/e^2
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x\left(a+b\log(cx^n)\right)^2}{(d+ex)^2}dx = \int \left(-\frac{d\left(a+b\log(cx^n)\right)^2}{e(d+ex)^2}+\frac{\left(a+b\log(cx^n)\right)^2}{e(d+ex)}\right)dx$$

$$= \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{d+ex}dx}{e} - \frac{d\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^2}dx}{e}$$

$$= -\frac{x\left(a+b\log(cx^n)\right)^2}{e(d+ex)} + \frac{\left(a+b\log(cx^n)\right)^2\log\left(1+\frac{ex}{d}\right)}{e^2} - \frac{(2bn)\int \frac{\left(a+b\log(cx^n)\right)\log(1+}{x}}{e^2}$$

$$= -\frac{x\left(a+b\log(cx^n)\right)^2}{e(d+ex)} + \frac{2bn\left(a+b\log(cx^n)\right)\log\left(1+\frac{ex}{d}\right)}{e^2} + \frac{\left(a+b\log(cx^n)\right)^2\log}{e^2}$$

$$= -\frac{x\left(a+b\log(cx^n)\right)^2}{e(d+ex)} + \frac{2bn\left(a+b\log(cx^n)\right)\log\left(1+\frac{ex}{d}\right)}{e^2} + \frac{\left(a+b\log(cx^n)\right)^2\log}{e^2}$$

Mathematica [A] time = 0.12, size = 142, normalized size = 0.99

$$\frac{2bn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log(cx^n)\right)+2bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right)+\frac{d\left(a+b\log(cx^n)\right)^2}{d+ex}+\log\left(\frac{ex}{d}+1\right)\left(a+b\log(c\right.}{e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```

```
[Out] (-(a + b*Log[c*x^n])^2 + (d*(a + b*Log[c*x^n])^2)/(d + e*x) + 2*b*n*(a + b*
Log[c*x^n])*Log[1 + (e*x)/d] + (a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 2*b^
2*n^2*PolyLog[2, -((e*x)/d)] + 2*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/
d)] - 2*b^2*n^2*PolyLog[3, -((e*x)/d)])/e^2
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x\log(cx^n)^2+2\,abx\log(cx^n)+a^2x}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x*log(c*x^n)^2 + 2*a*b*x*log(c*x^n) + a^2*x)/(e^2*x^2 + 2*d*e
*x + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log(cx^n)+a\right)^2x}{(ex+d)^2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x/(e*x + d)^2, x)
```

maple [F] time = 0.73, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^{n}\right)+a\right)^{2} x}{\left(ex+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)^2/(e*x+d)^2,x)
```

```
[Out] int(x*(b*ln(c*x^n)+a)^2/(e*x+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a^{2}\left(\frac{d}{e^{3}x+de^{2}}+\frac{\log\left(ex+d\right)}{e^{2}}\right)+\int \frac{b^{2}x\log\left(x^{n}\right)^{2}+2\left(b^{2}\log(c)+ab\right)x\log\left(x^{n}\right)+\left(b^{2}\log(c)^{2}+2\,ab\log(c)\right)x}{e^{2}x^{2}+2\,dex+d^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] a^2*(d/(e^3*x + d*e^2) + log(e*x + d)/e^2) + integrate((b^2*x*log(x^n)^2 +
2*(b^2*log(c) + a*b)*x*log(x^n) + (b^2*log(c)^2 + 2*a*b*log(c))*x)/(e^2*x^2
 + 2*d*e*x + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,{\left(a+b\,\ln\left(c\,x^{n}\right)\right)}^{2}}{{\left(d+e\,x\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n))^2)/(d + e*x)^2,x)
```

```
[Out] int((x*(a + b*log(c*x^n))^2)/(d + e*x)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(a+b\log\left(cx^{n}\right)\right)^{2}}{\left(d+ex\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))**2/(e*x+d)**2,x)
```

```
[Out] Integral(x*(a + b*log(c*x**n))**2/(d + e*x)**2, x)
```

3.103 $\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx$

Optimal. Leaf size=77

$$-\frac{2bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{de}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{d(d+ex)}-\frac{2b^2n^2\mathrm{Li}_2\left(-\frac{ex}{d}\right)}{de}$$

```
[Out] x*(a+b*ln(c*x^n))^2/d/(e*x+d)-2*b*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/d/e-2*b^2*n
^2*polylog(2,-e*x/d)/d/e
```

Rubi [A] time = 0.06, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.150$, Rules used = {2318, 2317, 2391}

$$-\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{de}-\frac{2bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{de}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{d(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(d + e*x)^2,x]
```

```
[Out] (x*(a + b*Log[c*x^n])^2)/(d*(d + e*x)) - (2*b*n*(a + b*Log[c*x^n])*Log[1 +
(e*x)/d])/(d*e) - (2*b^2*n^2*PolyLog[2, -((e*x)/d)])/(d*e)
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}\,dx &= \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{d(d+ex)}-\frac{(2bn)\int \frac{a+b\log\left(cx^n\right)}{d+ex}\,dx}{d}\\
&= \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{d(d+ex)}-\frac{2bn\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{de}+\frac{\left(2b^2n^2\right)\int \frac{\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{de}\\
&= \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{d(d+ex)}-\frac{2bn\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{de}-\frac{2b^2n^2\mathrm{Li}_2\left(-\frac{ex}{d}\right)}{de}
\end{aligned}$$

Mathematica [A] time = 0.05, size = 81, normalized size = 1.05

$$\frac{\left(a+b\log\left(cx^n\right)\right)\left(aex+bex\log\left(cx^n\right)-2bn(d+ex)\log\left(\frac{ex}{d}+1\right)\right)-2b^2n^2(d+ex)\text{Li}_2\left(-\frac{ex}{d}\right)}{de(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(d + e*x)^2,x]
```

```
[Out] ((a + b*Log[c*x^n])*(a*e*x + b*e*x*Log[c*x^n] - 2*b*n*(d + e*x)*Log[1 + (e*
x)/d]) - 2*b^2*n^2*(d + e*x)*PolyLog[2, -((e*x)/d)])/(d*e*(d + e*x))
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\log\left(cx^n\right)^2+2\,ab\log\left(cx^n\right)+a^2}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^2 + 2*d*e*x + d
^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^2}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/(e*x + d)^2, x)
```

maple [C] time = 0.27, size = 755, normalized size = 9.81

$$-\frac{b^2n^2\ln(x)^2}{de}-\frac{2ab\ln\left(x^n\right)}{(ex+d)\,e}-\frac{2b^2\ln(c)\ln\left(x^n\right)}{(ex+d)\,e}+\frac{2b^2n\ln(x)\ln\left(x^n\right)}{de}-\frac{2b^2n\ln\left(x^n\right)\ln(ex+d)}{de}-\frac{2abn\ln(ex+d)}{de}-\frac{2b^2n}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/(e*x+d)^2,x)
```

```
[Out] 2*b^2/e*n^2/d*dilog(-1/d*e*x)-b^2/e*n^2*ln(x)^2/d-2*b/(e*x+d)/e*ln(x^n)*a-2
/(e*x+d)/e*ln(x^n)*b^2*ln(c)+2*b^2/e*n*ln(x^n)/d*ln(x)-2*b^2/e*n*ln(x^n)/d*
ln(e*x+d)-2*b/e*n/d*ln(e*x+d)*a-2/e*n/d*ln(e*x+d)*b^2*ln(c)+2/e*n/d*ln(x)*b
^2*ln(c)+2*b/e*n/d*ln(x)*a+I/e*n/d*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-I/e*n/d
*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+2*b^2/e*n^2/d*ln(e*x+d)*ln(-1/d
*e*x)-1/4*(I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*csgn(I*c)*csgn(I*x^n)*
csgn(I*c*x^n)-I*Pi*b*csgn(I*c*x^n)^3+I*Pi*b*csgn(I*c)*csgn(I*c*x^n)^2+2*b*l
n(c)+2*a)^2/(e*x+d)/e-I/(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^
2+I/e*n/d*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I/e*n/d*ln(x)*b^2*Pi*csg
n(I*c*x^n)^2*csgn(I*c)+I/(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-I/e*n/d*ln(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-b^2/(e*x+d)
/e*ln(x^n)^2-I/(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-I/e*n/d*l
n(x)*b^2*Pi*csgn(I*c*x^n)^3-I/e*n/d*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+I/e*n/d*ln(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/(e
*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-2\,abn\left(\frac{\log\left(ex+d\right)}{de}-\frac{\log(x)}{de}\right)-b^2\left(\frac{\log\left(x^n\right)^2}{e^2x+de}-\int\frac{ex\log(c)^2+2\left(dn+\left(en+e\log(c)\right)x\right)\log\left(x^n\right)}{e^3x^3+2\,de^2x^2+d^2ex}\,dx\right)-\frac{2\,ab\log}{e^2x+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] -2*a*b*n*(log(e*x + d)/(d*e) - log(x)/(d*e)) - b^2*(log(x^n)^2/(e^2*x + d*e
) - integrate((e*x*log(c)^2 + 2*(d*n + (e*n + e*log(c))*x)*log(x^n))/(e^3*x
^3 + 2*d*e^2*x^2 + d^2*e*x), x)) - 2*a*b*log(c*x^n)/(e^2*x + d*e) - a^2/(e^
2*x + d*e)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\ \ln(c\,x^n))^2}{(d+e\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(d + e*x)^2,x)
```

```
[Out] int((a + b*log(c*x^n))^2/(d + e*x)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(d + e*x)**2, x)
```

3.104 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^2}\,dx$

Optimal. Leaf size=151

$$\frac{2bn\text{Li}_2\left(-\frac{d}{ex}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}+\frac{2bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}-\frac{\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{d^2}-\frac{ex\left(a+b\log\right.}{d^2(d+e}$$

```
[Out] -e*x*(a+b*ln(c*x^n))^2/d^2/(e*x+d)-ln(1+d/e/x)*(a+b*ln(c*x^n))^2/d^2+2*b*n*
(a+b*ln(c*x^n))*ln(1+e*x/d)/d^2+2*b*n*(a+b*ln(c*x^n))*polylog(2,-d/e/x)/d^2
+2*b^2*n^2*polylog(2,-e*x/d)/d^2+2*b^2*n^2*polylog(3,-d/e/x)/d^2
```

Rubi [A] time = 0.31, antiderivative size = 170, normalized size of antiderivative = 1.13, number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2347, 2344, 2302, 30, 2317, 2374, 6589, 2318, 2391}

$$-\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}+\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^2}-\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\right.}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x)^2),x]
```

```
[Out] -((e*x*(a + b*Log[c*x^n])^2)/(d^2*(d + e*x))) + (a + b*Log[c*x^n])^3/(3*b*d
^2*n) + (2*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^2 - ((a + b*Log[c*x^n
])^2*Log[1 + (e*x)/d])/d^2 + (2*b^2*n^2*PolyLog[2, -((e*x)/d)])/d^2 - (2*b*
n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^2 + (2*b^2*n^2*PolyLog[3, -(
(e*x)/d)])/d^2
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
```

```
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x(d+ex)^2}\,dx = \frac{\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x(d+ex)}\,dx}{d} - \frac{e\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}\,dx}{d}$$

$$= -\frac{ex\left(a+b\log\left(cx^n\right)\right)^2}{d^2(d+ex)} + \frac{\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx}{d^2} - \frac{e\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx}{d^2} + \frac{(2ben)\int \frac{a+b\log(}{d+e}}{d^2}$$

$$= -\frac{ex\left(a+b\log\left(cx^n\right)\right)^2}{d^2(d+ex)} + \frac{2bn\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{\left(a+b\log\left(cx^n\right)\right)^2\log}{d^2}$$

$$= -\frac{ex\left(a+b\log\left(cx^n\right)\right)^2}{d^2(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)^3}{3bd^2n} + \frac{2bn\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{(}{}$$

$$= -\frac{ex\left(a+b\log\left(cx^n\right)\right)^2}{d^2(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)^3}{3bd^2n} + \frac{2bn\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{(}{}$$

Mathematica [A] time = 0.17, size = 166, normalized size = 1.10

$$\frac{-6bn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right) - 3\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2 + \frac{3d\left(a+b\log\left(cx^n\right)\right)^2}{d+ex} + 6bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\right.}{3d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x)^2),x]
```

```
[Out] (-3*(a + b*Log[c*x^n])^2 + (3*d*(a + b*Log[c*x^n])^2)/(d + e*x) + (a + b*Lo
g[c*x^n])^3/(b*n) + 6*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 3*(a + b*Lo
g[c*x^n])^2*Log[1 + (e*x)/d] + 6*b^2*n^2*PolyLog[2, -((e*x)/d)] - 6*b*n*(a
+ b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 6*b^2*n^2*PolyLog[3, -((e*x)/d)])/
(3*d^2)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\log(cx^n)^2 + 2\,ab\log(cx^n) + a^2}{e^2x^3 + 2\,dex^2 + d^2x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^3 + 2*d*e*x^2 +
 d^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log(cx^n) + a\right)^2}{(ex+d)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^2*x), x)
```

maple [F] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n) + a)^2}{(ex+d)^2\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x/(e*x+d)^2,x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/x/(e*x+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a^2\left(\frac{1}{dex + d^2} - \frac{\log(ex+d)}{d^2} + \frac{\log(x)}{d^2}\right) + \int \frac{b^2\log(c)^2 + b^2\log(x^n)^2 + 2\,ab\log(c) + 2\left(b^2\log(c) + ab\right)\log(x^n)}{e^2x^3 + 2\,dex^2 + d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] a^2*(1/(d*e*x + d^2) - log(e*x + d)/d^2 + log(x)/d^2) + integrate((b^2*log(
c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e^2*
x^3 + 2*d*e*x^2 + d^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b\,\ln(c\,x^n))^2}{x\,(d + e\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x*(d + e*x)^2),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(x*(d + e*x)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b\log\left(cx^{n}\right)\right)^{2}}{x\left(d + ex\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x*(d + e*x)**2), x)
```

3.105 $\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)^2}\,dx$

Optimal. Leaf size=211

$$\frac{e^2x\left(a+b\log\left(cx^n\right)\right)^2}{d^3(d+ex)}-\frac{4benLi_2\left(-\frac{d}{ex}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{2ben\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{2e\log\left(\frac{d}{ex}+1\right)\left(a+\right.}{d^3}$$

```
[Out] -2*b^2*n^2/d^2/x-2*b*n*(a+b*ln(c*x^n))/d^2/x-(a+b*ln(c*x^n))^2/d^2/x+e^2*x*
(a+b*ln(c*x^n))^2/d^3/(e*x+d)+2*e*ln(1+d/e/x)*(a+b*ln(c*x^n))^2/d^3-2*b*e*n
*(a+b*ln(c*x^n))*ln(1+e*x/d)/d^3-4*b*e*n*(a+b*ln(c*x^n))*polylog(2,-d/e/x)/
d^3-2*b^2*e*n^2*polylog(2,-e*x/d)/d^3-4*b^2*e*n^2*polylog(3,-d/e/x)/d^3
```

Rubi [A] time = 0.31, antiderivative size = 231, normalized size of antiderivative = 1.09, number of steps used = 12, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2353, 2305, 2304, 2302, 30, 2318, 2317, 2391, 2374, 6589}

$$\frac{4ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{2b^2en^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}-\frac{4b^2en^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^3}+\frac{e^2x\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^2),x]
```

```
[Out] (-2*b^2*n^2)/(d^2*x) - (2*b*n*(a + b*Log[c*x^n]))/(d^2*x) - (a + b*Log[c*x^
n])^2/(d^2*x) + (e^2*x*(a + b*Log[c*x^n])^2)/(d^3*(d + e*x)) - (2*e*(a + b*
Log[c*x^n])^3)/(3*b*d^3*n) - (2*b*e*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/
d^3 + (2*e*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d^3 - (2*b^2*e*n^2*PolyLo
g[2, -((e*x)/d)])/d^3 + (4*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])
/d^3 - (4*b^2*e*n^2*PolyLog[3, -((e*x)/d)])/d^3
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
```

```
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2(d+ex)^2}\,dx=\int\left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^2x^2}-\frac{2e\left(a+b\log\left(cx^n\right)\right)^2}{d^3x}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{d^2(d+ex)^2}+\frac{2e^2\left(a+b\,\mathrm{lo}\right.}{d^3(d+}\right.$$

$$=\frac{\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\,dx}{d^2}-\frac{(2e)\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx}{d^3}+\frac{\left(2e^2\right)\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx}{d^3}+\frac{e^2\int\frac{(a+b\log}{(d+e}}{d^2}$$

$$=-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^2x}+\frac{e^2x\left(a+b\log\left(cx^n\right)\right)^2}{d^3(d+ex)}+\frac{2e\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{d^3}-$$

$$=-\frac{2b^2n^2}{d^2x}-\frac{2bn\left(a+b\log\left(cx^n\right)\right)}{d^2x}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^2x}+\frac{e^2x\left(a+b\log\left(cx^n\right)\right)^2}{d^3(d+ex)}-\frac{2e\left(\right.}{}$$

$$=-\frac{2b^2n^2}{d^2x}-\frac{2bn\left(a+b\log\left(cx^n\right)\right)}{d^2x}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^2x}+\frac{e^2x\left(a+b\log\left(cx^n\right)\right)^2}{d^3(d+ex)}-\frac{2e\left(\right.}{}$$

Mathematica [A] time = 0.32, size = 223, normalized size = 1.06

$$-\frac{-12ben\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)-6e\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2+\frac{3de\left(a+b\log(cx^n)\right)^2}{d+ex}+6ben\log\left(\frac{ex}{d}+1\right)\left(a+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^2),x]
```

```
[Out] -1/3*((6*b^2*d*n^2)/x + (6*b*d*n*(a + b*Log[c*x^n]))/x - 3*e*(a + b*Log[c*x
^n])^2 + (3*d*(a + b*Log[c*x^n])^2)/x + (3*d*e*(a + b*Log[c*x^n])^2)/(d + e
*x) + (2*e*(a + b*Log[c*x^n])^3)/(b*n) + 6*b*e*n*(a + b*Log[c*x^n])*Log[1 +
 (e*x)/d] - 6*e*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 6*b^2*e*n^2*PolyLog
[2, -((e*x)/d)] - 12*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 12*b
^2*e*n^2*PolyLog[3, -((e*x)/d)])/d^3
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\log\left(cx^n\right)^2+2\,ab\log\left(cx^n\right)+a^2}{e^2x^4+2\,dex^3+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^4 + 2*d*e*x^3 +
 d^2*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^2}{(ex+d)^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^2*x^2), x)
```

maple [F] time = 0.73, size = 0, normalized size = 0.00

$$\int\frac{\left(b\ln\left(c\,x^n\right)+a\right)^2}{(ex+d)^2\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x^2/(e*x+d)^2,x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/x^2/(e*x+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^2\left(\frac{2\,ex+d}{d^2ex^2+d^3x}-\frac{2\,e\log\left(ex+d\right)}{d^3}+\frac{2\,e\log(x)}{d^3}\right)+\int\frac{b^2\log(c)^2+b^2\log\left(x^n\right)^2+2\,ab\log(c)+2\left(b^2\log(c)+ab\right)\log\left(x^n\right)}{e^2x^4+2\,dex^3+d^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] -a^2*((2*e*x + d)/(d^2*e*x^2 + d^3*x) - 2*e*log(e*x + d)/d^3 + 2*e*log(x)/d
^3) + integrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(
c) + a*b)*log(x^n))/(e^2*x^4 + 2*d*e*x^3 + d^2*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\ln(c\,x^n))^2}{x^2\,(d + e\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x^2*(d + e*x)^2),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(x^2*(d + e*x)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b\log\left(cx^n\right)\right)^2}{x^2\left(d + ex\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**2/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x**2*(d + e*x)**2), x)
```

3.106 $\int \frac{\left(a+b\log(cx^n)\right)^2}{x^3(d+ex)^2}\,dx$

Optimal. Leaf size=285

$$-\frac{e^3x\left(a+b\log\left(cx^n\right)\right)^2}{d^4(d+ex)}+\frac{6be^2n\text{Li}_2\left(-\frac{d}{ex}\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{3e^2\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{d^4}+\frac{2be^2n\log\left(\frac{ex}{d}+1\right)}{d^4}$$

```
[Out] -1/4*b^2*n^2/d^2/x^2+4*b^2*e*n^2/d^3/x-1/2*b*n*(a+b*ln(c*x^n))/d^2/x^2+4*b*
e*n*(a+b*ln(c*x^n))/d^3/x-1/2*(a+b*ln(c*x^n))^2/d^2/x^2+2*e*(a+b*ln(c*x^n))
^2/d^3/x-e^3*x*(a+b*ln(c*x^n))^2/d^4/(e*x+d)-3*e^2*ln(1+d/e/x)*(a+b*ln(c*x^
n))^2/d^4+2*b*e^2*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/d^4+6*b*e^2*n*(a+b*ln(c*x^n
))*polylog(2,-d/e/x)/d^4+2*b^2*e^2*n^2*polylog(2,-e*x/d)/d^4+6*b^2*e^2*n^2*
polylog(3,-d/e/x)/d^4
```

Rubi [A] time = 0.38, antiderivative size = 304, normalized size of antiderivative = 1.07, number of steps used = 14, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2353, 2305, 2304, 2302, 30, 2318, 2317, 2391, 2374, 6589}

$$-\frac{6be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}+\frac{2b^2e^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}+\frac{6b^2e^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^4}-\frac{e^3x\left(a+b\log\right.}{d^4(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x^3*(d + e*x)^2),x]
```

```
[Out] -(b^2*n^2)/(4*d^2*x^2) + (4*b^2*e*n^2)/(d^3*x) - (b*n*(a + b*Log[c*x^n]))/(
2*d^2*x^2) + (4*b*e*n*(a + b*Log[c*x^n]))/(d^3*x) - (a + b*Log[c*x^n])^2/(2
*d^2*x^2) + (2*e*(a + b*Log[c*x^n])^2)/(d^3*x) - (e^3*x*(a + b*Log[c*x^n])^
2)/(d^4*(d + e*x)) + (e^2*(a + b*Log[c*x^n])^3)/(b*d^4*n) + (2*b*e^2*n*(a +
 b*Log[c*x^n])*Log[1 + (e*x)/d])/d^4 - (3*e^2*(a + b*Log[c*x^n])^2*Log[1 +
(e*x)/d])/d^4 + (2*b^2*e^2*n^2*PolyLog[2, -((e*x)/d)])/d^4 - (6*b*e^2*n*(a
+ b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^4 + (6*b^2*e^2*n^2*PolyLog[3, -((
e*x)/d)])/d^4
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
```

```
c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^3(d+ex)^2}\,dx = \int \left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^2x^3} - \frac{2e\left(a+b\log\left(cx^n\right)\right)^2}{d^3x^2} + \frac{3e^2\left(a+b\log\left(cx^n\right)\right)^2}{d^4x} - \frac{e^3\left(a+b\log\left(\right.\right.}{d^3(d+ex}\right.$$

$$= \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{x^3}dx}{d^2} - \frac{(2e)\int \frac{\left(a+b\log(cx^n)\right)^2}{x^2}dx}{d^3} + \frac{\left(3e^2\right)\int \frac{\left(a+b\log(cx^n)\right)^2}{x}dx}{d^4} - \frac{\left(3e^3\right)\int \frac{\left(a+b\log\right.}{d+}}{d^4}$$

$$= -\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^2x^2} + \frac{2e\left(a+b\log\left(cx^n\right)\right)^2}{d^3x} - \frac{e^3x\left(a+b\log\left(cx^n\right)\right)^2}{d^4(d+ex)} - \frac{3e^2\left(a+b\log\left(c\right.\right.}{}$$

$$= -\frac{b^2n^2}{4d^2x^2} + \frac{4b^2en^2}{d^3x} - \frac{bn\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2} + \frac{4ben\left(a+b\log\left(cx^n\right)\right)}{d^3x} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^2x^2}$$

$$= -\frac{b^2n^2}{4d^2x^2} + \frac{4b^2en^2}{d^3x} - \frac{bn\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2} + \frac{4ben\left(a+b\log\left(cx^n\right)\right)}{d^3x} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^2x^2}$$

Mathematica [A] time = 0.19, size = 268, normalized size = 0.94

$$\frac{4e^2\left(2b^2n^2\text{Li}_2\left(-\frac{ex}{d}\right) - \left(a+b\log\left(cx^n\right)\right)\left(a+b\log\left(cx^n\right) - 2bn\log\left(\frac{ex}{d}+1\right)\right)\right) - \frac{2d^2\left(a+b\log(cx^n)\right)^2}{x^2} - \frac{bd^2n\left(2a+2b\log(cx^n)+\right.}{x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x^3*(d + e*x)^2),x]
```

```
[Out] ((-2*d^2*(a + b*Log[c*x^n])^2)/x^2 + (8*d*e*(a + b*Log[c*x^n])^2)/x + (4*d*
e^2*(a + b*Log[c*x^n])^2)/(d + e*x) + (4*e^2*(a + b*Log[c*x^n])^3)/(b*n) +
(16*b*d*e*n*(a + b*n + b*Log[c*x^n]))/x - (b*d^2*n*(2*a + b*n + 2*b*Log[c*x
^n]))/x^2 - 12*e^2*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 4*e^2*(-((a + b*
Log[c*x^n])*(a + b*Log[c*x^n] - 2*b*n*Log[1 + (e*x)/d])) + 2*b^2*n^2*PolyLo
g[2, -((e*x)/d)]) - 24*b*e^2*n*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] -
 b*n*PolyLog[3, -((e*x)/d)]))/(4*d^4)
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\log\left(cx^n\right)^2 + 2\,ab\log\left(cx^n\right) + a^2}{e^2x^5 + 2\,dex^4 + d^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^3/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^5 + 2*d*e*x^4 +
 d^2*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2}{\left(ex+d\right)^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^3/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^2*x^3), x)
```

maple [F] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^{n}\right)+a\right)^{2}}{\left(ex+d\right)^{2}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x^3/(e*x+d)^2,x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/x^3/(e*x+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}a^{2}\left(\frac{6\,e^{2}x^{2}+3\,dex-d^{2}}{d^{3}ex^{3}+d^{4}x^{2}}-\frac{6\,e^{2}\log\left(ex+d\right)}{d^{4}}+\frac{6\,e^{2}\log(x)}{d^{4}}\right)+\int\frac{b^{2}\log(c)^{2}+b^{2}\log\left(x^{n}\right)^{2}+2\,ab\log(c)+2\left(b^{2}\log\right.}{e^{2}x^{5}+2\,dex^{4}+d^{2}x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^3/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*((6*e^2*x^2 + 3*d*e*x - d^2)/(d^3*e*x^3 + d^4*x^2) - 6*e^2*log(e*x
+ d)/d^4 + 6*e^2*log(x)/d^4) + integrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2
*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e^2*x^5 + 2*d*e*x^4 + d^2*x^3
), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\ln\left(c\,x^{n}\right)\right)^{2}}{x^{3}\,\left(d+e\,x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x^3*(d + e*x)^2),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(x^3*(d + e*x)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^{n}\right)\right)^{2}}{x^{3}\left(d+ex\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**3/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x**3*(d + e*x)**2), x)
```

3.107 $\int \frac{x^3\left(a+b\log(cx^n)\right)^2}{(d+ex)^3}\,dx$

Optimal. Leaf size=296

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{2e^4(d+ex)^2}-\frac{6bdn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^4}-\frac{3d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{e^4}-5$$

```
[Out] -2*a*b*n*x/e^3+2*b^2*n^2*x/e^3-2*b^2*n*x*ln(c*x^n)/e^3+b*d*n*x*(a+b*ln(c*x^
n))/e^3/(e*x+d)-1/2*d*(a+b*ln(c*x^n))^2/e^4+x*(a+b*ln(c*x^n))^2/e^3+1/2*d^3
*(a+b*ln(c*x^n))^2/e^4/(e*x+d)^2+3*d*x*(a+b*ln(c*x^n))^2/e^3/(e*x+d)-b^2*d*
n^2*ln(e*x+d)/e^4-5*b*d*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/e^4-3*d*(a+b*ln(c*x^n
))^2*ln(1+e*x/d)/e^4-5*b^2*d*n^2*polylog(2,-e*x/d)/e^4-6*b*d*n*(a+b*ln(c*x^
n))*polylog(2,-e*x/d)/e^4+6*b^2*d*n^2*polylog(3,-e*x/d)/e^4
```

Rubi [A] time = 0.49, antiderivative size = 296, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 14, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.609$, Rules used = {2353, 2296, 2295, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 2318, 2374, 6589}

$$-\frac{6bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{5b^2dn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}+\frac{6b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}+\frac{d^3\left(a+b\log\left(cx\right.\right.}{2e^4(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] (-2*a*b*n*x)/e^3 + (2*b^2*n^2*x)/e^3 - (2*b^2*n*x*Log[c*x^n])/e^3 + (b*d*n*
x*(a + b*Log[c*x^n]))/(e^3*(d + e*x)) - (d*(a + b*Log[c*x^n])^2)/(2*e^4) +
(x*(a + b*Log[c*x^n])^2)/e^3 + (d^3*(a + b*Log[c*x^n])^2)/(2*e^4*(d + e*x)^
2) + (3*d*x*(a + b*Log[c*x^n])^2)/(e^3*(d + e*x)) - (b^2*d*n^2*Log[d + e*x]
)/e^4 - (5*b*d*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^4 - (3*d*(a + b*Log
[c*x^n])^2*Log[1 + (e*x)/d])/e^4 - (5*b^2*d*n^2*PolyLog[2, -((e*x)/d)])/e^4
 - (6*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^4 + (6*b^2*d*n^2*P
olyLog[3, -((e*x)/d)])/e^4
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^3}\,dx = \int\left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{e^3} - \frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)^3} + \frac{3d^2\left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)^2} - \frac{3d\left(a+b\log\right.}{e^3(d\right.}\right.$$

$$= \frac{\int\left(a+b\log\left(cx^n\right)\right)^2\,dx}{e^3} - \frac{(3d)\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx}{e^3} + \frac{\left(3d^2\right)\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}\,dx}{e^3} - \frac{d^3\int}{}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e^3} + \frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{2e^4(d+ex)^2} + \frac{3dx\left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)} - \frac{3d\left(a+b\log\right.}{}$$

$$= -\frac{2abnx}{e^3} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e^3} + \frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{2e^4(d+ex)^2} + \frac{3dx\left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)} - \frac{6}{}$$

$$= -\frac{2abnx}{e^3} + \frac{2b^2n^2x}{e^3} - \frac{2b^2nx\log\left(cx^n\right)}{e^3} + \frac{bdnx\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)} + \frac{x\left(a+b\log\left(cx^n\right)\right)}{e^3}$$

$$= -\frac{2abnx}{e^3} + \frac{2b^2n^2x}{e^3} - \frac{2b^2nx\log\left(cx^n\right)}{e^3} + \frac{bdnx\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)} - \frac{d\left(a+b\log\left(cx^n\right)\right)}{2e^4}$$

$$= -\frac{2abnx}{e^3} + \frac{2b^2n^2x}{e^3} - \frac{2b^2nx\log\left(cx^n\right)}{e^3} + \frac{bdnx\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)} - \frac{d\left(a+b\log\left(cx^n\right)\right)}{2e^4}$$

Mathematica [A] time = 0.27, size = 258, normalized size = 0.87

$$\frac{\frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2} - \frac{6d^2\left(a+b\log\left(cx^n\right)\right)^2}{d+ex} - \frac{2bd^2n\left(a+b\log\left(cx^n\right)\right)}{d+ex} - 12bdn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right) - 6d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] ((-2*b*d^2*n*(a + b*Log[c*x^n]))/(d + e*x) + 5*d*(a + b*Log[c*x^n])^2 + 2*e
*x*(a + b*Log[c*x^n])^2 + (d^3*(a + b*Log[c*x^n])^2)/(d + e*x)^2 - (6*d^2*(
a + b*Log[c*x^n])^2)/(d + e*x) - 4*b*e*n*x*(a - b*n + b*Log[c*x^n]) + 2*b^2
*d*n^2*(Log[x] - Log[d + e*x]) - 10*b*d*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/
d] - 6*d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] - 10*b^2*d*n^2*PolyLog[2, -(
(e*x)/d)] - 12*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 12*b^2*d*n
^2*PolyLog[3, -((e*x)/d)])/(2*e^4)
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^3\log\left(cx^n\right)^2 + 2\,abx^3\log\left(cx^n\right) + a^2x^3}{e^3x^3 + 3\,de^2x^2 + 3\,d^2ex + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*log(c*x^n)^2 + 2*a*b*x^3*log(c*x^n) + a^2*x^3)/(e^3*x^3 +
 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log \left(cx^{n}\right) + a\right)^{2} x^{3}}{(ex + d)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^3/(e*x + d)^3, x)
```

maple [F] time = 0.75, size = 0, normalized size = 0.00

$$\int \frac{(b \ln (c\,x^{n}) + a)^{2}\, x^{3}}{(ex + d)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)^2/(e*x+d)^3,x)
```

```
[Out] int(x^3*(b*ln(c*x^n)+a)^2/(e*x+d)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\, a^{2}\left(\frac{6\, d^{2} ex + 5\, d^{3}}{e^{6}x^{2} + 2\, de^{5}x + d^{2}e^{4}} - \frac{2\, x}{e^{3}} + \frac{6\, d \log (ex + d)}{e^{4}}\right) + \int \frac{b^{2}x^{3} \log (x^{n})^{2} + 2\left(b^{2} \log(c) + ab\right)x^{3} \log (x^{n}) + \left(b^{2} l\right.}{e^{3}x^{3} + 3\, de^{2}x^{2} + 3\, d^{2}ex + d^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*((6*d^2*e*x + 5*d^3)/(e^6*x^2 + 2*d*e^5*x + d^2*e^4) - 2*x/e^3 + 6
*d*log(e*x + d)/e^4) + integrate((b^2*x^3*log(x^n)^2 + 2*(b^2*log(c) + a*b)
*x^3*log(x^n) + (b^2*log(c)^2 + 2*a*b*log(c))*x^3)/(e^3*x^3 + 3*d*e^2*x^2 +
 3*d^2*e*x + d^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^{3}\,(a + b\,\ln (c\,x^{n}))^{2}}{(d + e\,x)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n))^2)/(d + e*x)^3,x)
```

```
[Out] int((x^3*(a + b*log(c*x^n))^2)/(d + e*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \left(a + b \log (cx^{n})\right)^{2}}{(d + ex)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))**2/(e*x+d)**3,x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))**2/(d + e*x)**3, x)
```

3.108 $\int \frac{x^2(a+b\log(cx^n))^2}{(d+ex)^3}\,dx$

Optimal. Leaf size=232

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^3(d+ex)^2}+\frac{2bn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{3bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\right.}{e^3}$$

```
[Out] -b*n*x*(a+b*ln(c*x^n))/e^2/(e*x+d)+1/2*(a+b*ln(c*x^n))^2/e^3-1/2*d^2*(a+b*l
n(c*x^n))^2/e^3/(e*x+d)^2-2*x*(a+b*ln(c*x^n))^2/e^2/(e*x+d)+b^2*n^2*ln(e*x+
d)/e^3+3*b*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/e^3+(a+b*ln(c*x^n))^2*ln(1+e*x/d)/
e^3+3*b^2*n^2*polylog(2,-e*x/d)/e^3+2*b*n*(a+b*ln(c*x^n))*polylog(2,-e*x/d)
/e^3-2*b^2*n^2*polylog(3,-e*x/d)/e^3
```

Rubi [A] time = 0.45, antiderivative size = 232, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 2318, 2374, 6589}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^3(d+ex)^2}-$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] -((b*n*x*(a + b*Log[c*x^n]))/(e^2*(d + e*x))) + (a + b*Log[c*x^n])^2/(2*e^3
) - (d^2*(a + b*Log[c*x^n])^2)/(2*e^3*(d + e*x)^2) - (2*x*(a + b*Log[c*x^n]
)^2)/(e^2*(d + e*x)) + (b^2*n^2*Log[d + e*x])/e^3 + (3*b*n*(a + b*Log[c*x^n
])*Log[1 + (e*x)/d])/e^3 + ((a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^3 + (3
*b^2*n^2*PolyLog[2, -((e*x)/d)])/e^3 + (2*b*n*(a + b*Log[c*x^n])*PolyLog[2,
 -((e*x)/d)])/e^3 - (2*b^2*n^2*PolyLog[3, -((e*x)/d)])/e^3
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2 \left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^3}\,dx = \int \left(\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)^3} - \frac{2d\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)^2} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)}\right)dx$$

$$= \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{d+ex}dx}{e^2} - \frac{(2d)\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^2}dx}{e^2} + \frac{d^2\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^3}dx}{e^2}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^3(d+ex)^2} - \frac{2x\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{e^3} - \frac{(2}{}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^3(d+ex)^2} - \frac{2x\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)} + \frac{4bn\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e^3} +$$

$$= -\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)} - \frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^3(d+ex)^2} - \frac{2x\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)} + \frac{4bn\left(a+b\right.}{}$$

$$= -\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e^3} - \frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^3(d+ex)^2} - \frac{2x\left(a+b\log\right.}{e^2(d+e}$$

$$= -\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e^3} - \frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^3(d+ex)^2} - \frac{2x\left(a+b\log\right.}{e^2(d+e}$$

Mathematica [A] time = 0.28, size = 212, normalized size = 0.91

$$\frac{-\frac{d^2\left(a+b\log(cx^n)\right)^2}{(d+ex)^2} + 4bn\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right) + \frac{2bdn\left(a+b\log(cx^n)\right)}{d+ex} + 6bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right) + \frac{4d\left(a+b\log\right.}{d+e}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] ((2*b*d*n*(a + b*Log[c*x^n]))/(d + e*x) - 3*(a + b*Log[c*x^n])^2 - (d^2*(a
+ b*Log[c*x^n])^2)/(d + e*x)^2 + (4*d*(a + b*Log[c*x^n])^2)/(d + e*x) - 2*b
^2*n^2*(Log[x] - Log[d + e*x]) + 6*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d]
+ 2*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 6*b^2*n^2*PolyLog[2, -((e*x)/d)
] + 4*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - 4*b^2*n^2*PolyLog[3,
-((e*x)/d)])/(2*e^3)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^2\log\left(cx^n\right)^2 + 2\,abx^2\log\left(cx^n\right) + a^2x^2}{e^3x^3 + 3\,de^2x^2 + 3\,d^2ex + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*log(c*x^n)^2 + 2*a*b*x^2*log(c*x^n) + a^2*x^2)/(e^3*x^3 +
 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2 x^2}{\left(ex+d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)^2*x^2/(e*x + d)^3, x)
```

maple [F] time = 0.77, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(cx^n)+a)^2 x^2}{(ex+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)^2/(e*x+d)^3,x)
[Out] int(x^2*(b*ln(c*x^n)+a)^2/(e*x+d)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}a^2\left(\frac{4\,dex+3\,d^2}{e^5x^2+2\,de^4x+d^2e^3}+\frac{2\,\log(ex+d)}{e^3}\right)+\int\frac{b^2x^2\log(x^n)^2+2\left(b^2\log(c)+ab\right)x^2\log(x^n)+\left(b^2\log(c)^2+\right.}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="maxima")
[Out] 1/2*a^2*((4*d*e*x + 3*d^2)/(e^5*x^2 + 2*d*e^4*x + d^2*e^3) + 2*log(e*x + d)
/e^3) + integrate((b^2*x^2*log(x^n)^2 + 2*(b^2*log(c) + a*b)*x^2*log(x^n) +
 (b^2*log(c)^2 + 2*a*b*log(c))*x^2)/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^
3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,(a+b\,\ln(c\,x^n))^2}{(d+e\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n))^2)/(d + e*x)^3,x)
[Out] int((x^2*(a + b*log(c*x^n))^2)/(d + e*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2\left(a+b\log(cx^n)\right)^2}{(d+ex)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))**2/(e*x+d)**3,x)
[Out] Integral(x**2*(a + b*log(c*x**n))**2/(d + e*x)**3, x)
```

3.109 $\int \frac{x\left(a+b\log(cx^n)\right)^2}{(d+ex)^3}\,dx$

Optimal. Leaf size=112

$$-\frac{bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)+bn\right)}{de^2}+\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)^2}{2d(d+ex)^2}-\frac{b^2n^2\text{Li}_2\left(-\frac{ex}{d}\right)}{de^2}$$

```
[Out] b*n*x*(a+b*ln(c*x^n))/d/e/(e*x+d)+1/2*x^2*(a+b*ln(c*x^n))^2/d/(e*x+d)^2-b*n
*(a+b*n+b*ln(c*x^n))*ln(1+e*x/d)/d/e^2-b^2*n^2*polylog(2,-e*x/d)/d/e^2
```

Rubi [A] time = 0.36, antiderivative size = 176, normalized size of antiderivative = 1.57, number of steps used = 13, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 2318}

$$-\frac{b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{de^2}-\frac{bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{de^2}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2de^2}+\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2}+\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] (b*n*x*(a + b*Log[c*x^n]))/(d*e*(d + e*x)) - (a + b*Log[c*x^n])^2/(2*d*e^2)
 + (d*(a + b*Log[c*x^n])^2)/(2*e^2*(d + e*x)^2) + (x*(a + b*Log[c*x^n])^2)/
(d*e*(d + e*x)) - (b^2*n^2*Log[d + e*x])/(d*e^2) - (b*n*(a + b*Log[c*x^n])*
Log[1 + (e*x)/d])/(d*e^2) - (b^2*n^2*PolyLog[2, -((e*x)/d)])/(d*e^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^3}\,dx = \int \left(-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^3} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^2}\right)dx$$

$$= \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^2}dx}{e} - \frac{d\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^3}dx}{e}$$

$$= \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)} - \frac{(bdn)\int \frac{a+b\log(cx^n)}{x(d+ex)^2}dx}{e^2} - \frac{(2bn)\int \frac{a+b\log(c}{d+ex}}{de}$$

$$= \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{de^2} - (bn$$

$$= \frac{bnx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)} + \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)} - \frac{2bn\left(a+b\log(\right.}{d}$$

$$= \frac{bnx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2de^2} + \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} + \frac{x\left(a+b\log\left(cx^n\right)\right.}{de(d+ex)}$$

$$= \frac{bnx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2de^2} + \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} + \frac{x\left(a+b\log\left(cx^n\right)\right.}{de(d+ex)}$$

Mathematica [A] time = 0.24, size = 155, normalized size = 1.38

$$\frac{-\frac{2bn\left(a+b\log(cx^n)\right)}{d+ex} - \frac{2bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right)}{d} - \frac{2\left(a+b\log(cx^n)\right)^2}{d+ex} + \frac{d\left(a+b\log(cx^n)\right)^2}{(d+ex)^2} + \frac{\left(a+b\log(cx^n)\right)^2}{d} - \frac{2b^2n^2\text{Li}_2\left(-\frac{ex}{d}\right)}{d} + \frac{2b^2n^2(\log}{}}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] ((-2*b*n*(a + b*Log[c*x^n]))/(d + e*x) + (a + b*Log[c*x^n])^2/d + (d*(a + b
*Log[c*x^n])^2)/(d + e*x)^2 - (2*(a + b*Log[c*x^n])^2)/(d + e*x) + (2*b^2*n
^2*(Log[x] - Log[d + e*x]))/d - (2*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])
/d - (2*b^2*n^2*PolyLog[2, -((e*x)/d)])/d)/(2*e^2)
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x\log\left(cx^n\right)^2 + 2\,abx\log\left(cx^n\right) + a^2x}{e^3x^3 + 3\,de^2x^2 + 3\,d^2ex + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*x*log(c*x^n)^2 + 2*a*b*x*log(c*x^n) + a^2*x)/(e^3*x^3 + 3*d*e
^2*x^2 + 3*d^2*e*x + d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right) + a\right)^2 x}{(ex+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x/(e*x + d)^3, x)
```

maple [C] time = 0.32, size = 1199, normalized size = 10.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)^2/(e*x+d)^3,x)
```

```
[Out] 1/2*I*ln(x^n)*d/e^2/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I/e^2*
n/d*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*ln(x^n)*d/e^2/(e*x+d)^
2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I/e^2*ln(x^n)/(e*x+d)*b^2*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I/e^2*n/d*ln(x)*b^2*Pi*csgn(I*c*x^n)^3+1/2*I
/e^2*n/d*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3+1/2*I/e^2*n/d*ln(e*x+d)*b^2*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*(-I*Pi*b*csgn(I*c)*csgn(I*x^n)*csgn(I
*c*x^n)+I*Pi*b*csgn(I*c)*csgn(I*c*x^n)^2+I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2
-I*Pi*b*csgn(I*c*x^n)^3+2*b*ln(c)+2*a)^2*(1/2*d/e^2/(e*x+d)^2-1/e^2/(e*x+d)
)-b^2*ln(x^n)^2/e^2/(e*x+d)-1/2*I/e^2*n/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn
(I*c)-I/e^2*ln(x^n)/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I/e^2*n/(e
*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(x^n)*d/e^2/(e*x+d)^2*b^2*
Pi*csgn(I*c*x^n)^3+1/2*I/e^2*n/d*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1
/2*I/e^2*n/d*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I/e^2*n/(e*x+d)*b^2
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I/e^2*n/d*ln(e*x+d)*b^2*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2-1/2*I/e^2*n/d*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)+I/e^2*ln(x^n)/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+1/2*I*ln(x^n)*d/e^2/(e*x+d)^2*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I/e^2*
n/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3+I/e^2*ln(x^n)/(e*x+d)*b^2*Pi*csgn(I*c*x^n)
^3+b^2/e^2*n^2/d*ln(e*x+d)*ln(-1/d*e*x)+b*ln(x^n)*d/e^2/(e*x+d)^2*a+ln(x^n)
*d/e^2/(e*x+d)^2*b^2*ln(c)+b^2*n/e^2*ln(x^n)/d*ln(x)-b^2*n/e^2*ln(x^n)/d*ln
(e*x+d)-1/e^2*n/(e*x+d)*b^2*ln(c)-b/e^2*n/(e*x+d)*a-1/2*b^2/e^2*n^2*ln(x)^2
/d+b^2/e^2*n^2/d*ln(x)-b^2/e^2*n^2/d*ln(e*x+d)+b^2/e^2*n^2/d*dilog(-1/d*e*x
)-2*b/e^2*ln(x^n)/(e*x+d)*a-2/e^2*ln(x^n)/(e*x+d)*b^2*ln(c)-b^2*n/e^2*ln(x^
n)/(e*x+d)+1/2*b^2*ln(x^n)^2*d/e^2/(e*x+d)^2+b/e^2*n/d*ln(x)*a-b/e^2*n/d*ln
(e*x+d)*a+1/e^2*n/d*ln(x)*b^2*ln(c)-1/e^2*n/d*ln(e*x+d)*b^2*ln(c)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-abn\left(\frac{1}{e^3x+de^2}+\frac{\log(ex+d)}{de^2}-\frac{\log(x)}{de^2}\right)-\frac{1}{2}\left(\frac{(2\,ex+d)\log(x^n)^2}{e^4x^2+2\,de^3x+d^2e^2}-2\int\frac{e^2x^2\log(c)^2+\left(3\,denx+d^2n+2\,(e\right.}{e^5x^4+3\,de^4x^3+3\,d^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] -a*b*n*(1/(e^3*x + d*e^2) + log(e*x + d)/(d*e^2) - log(x)/(d*e^2)) - 1/2*((
2*e*x + d)*log(x^n)^2/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 2*integrate((e^2*x^
2*log(c)^2 + (3*d*e*n*x + d^2*n + 2*(e^2*n + e^2*log(c))*x^2)*log(x^n))/(e^
5*x^4 + 3*d*e^4*x^3 + 3*d^2*e^3*x^2 + d^3*e^2*x), x))*b^2 - (2*e*x + d)*a*b
*log(c*x^n)/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 1/2*(2*e*x + d)*a^2/(e^4*x^2
+ 2*d*e^3*x + d^2*e^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2}{{\left(d+e\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n))^2)/(d + e*x)^3,x)
```

```
[Out] int((x*(a + b*log(c*x^n))^2)/(d + e*x)^3, x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(a+b\log\left(cx^{n}\right)\right)^{2}}{\left(d+ex\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))**2/(e*x+d)**3,x)
```

```
[Out] Integral(x*(a + b*log(c*x**n))**2/(d + e*x)**3, x)
```

3.110 $\int \frac{(a+b\log(cx^n))^2}{(d+ex)^3}\,dx$

Optimal. Leaf size=126

$$-\frac{bn\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2e}-\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{d^2(d+ex)}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e(d+ex)^2}+\frac{b^2n^2\text{Li}_2\left(-\frac{d}{ex}\right)}{d^2e}+\frac{b^2n^2\log(d+ex)}{d^2e}$$

```
[Out] -b*n*x*(a+b*ln(c*x^n))/d^2/(e*x+d)-b*n*ln(1+d/e/x)*(a+b*ln(c*x^n))/d^2/e-1/
2*(a+b*ln(c*x^n))^2/e/(e*x+d)^2+b^2*n^2*ln(e*x+d)/d^2/e+b^2*n^2*polylog(2,-
d/e/x)/d^2/e
```

Rubi [A] time = 0.20, antiderivative size = 145, normalized size of antiderivative = 1.15, number of steps used = 8, number of rules used = 8, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {2319, 2347, 2344, 2301, 2317, 2391, 2314, 31}

$$-\frac{b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2e}-\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{d^2(d+ex)}-\frac{bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2e}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(d + e*x)^3,x]
```

```
[Out] -((b*n*x*(a + b*Log[c*x^n]))/(d^2*(d + e*x))) + (a + b*Log[c*x^n])^2/(2*d^2
*e) - (a + b*Log[c*x^n])^2/(2*e*(d + e*x)^2) + (b^2*n^2*Log[d + e*x])/(d^2*
e) - (b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(d^2*e) - (b^2*n^2*PolyLog[2
, -((e*x)/d)])/(d^2*e)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
```

```
NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^3}\,dx &= -\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e(d+ex)^2}+\frac{(bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{e}\\
&= -\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e(d+ex)^2}-\frac{(bn)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d}+\frac{(bn)\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx}{de}\\
&= -\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{d^2(d+ex)}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e(d+ex)^2}-\frac{(bn)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^2}+\frac{(bn)\int \frac{a+b\log(cx^n)}{x}}{d^2e}\\
&= -\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{d^2(d+ex)}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e(d+ex)^2}+\frac{b^2n^2\log(d+ex)}{d^2e}-\\
&= -\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{d^2(d+ex)}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e(d+ex)^2}+\frac{b^2n^2\log(d+ex)}{d^2e}-
\end{aligned}
$$

Mathematica [A] time = 0.10, size = 146, normalized size = 1.16

$$
\frac{bn\left(-\frac{\log\left(\frac{d+ex}{d}\right)\left(a+b\log(cx^n)\right)}{d^2}+\frac{\left(a+b\log(cx^n)\right)^2}{2bd^2n}+\frac{a+b\log(cx^n)}{d(d+ex)}-\frac{bn\text{Li}_2\left(-\frac{ex}{d}\right)}{d^2}-\frac{bn\left(\frac{\log(x)}{d}-\frac{\log(d+ex)}{d}\right)}{d}\right)}{e}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e(d+ex)^2}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(d + e*x)^3,x]
```

```
[Out] -1/2*(a + b*Log[c*x^n])^2/(e*(d + e*x)^2) + (b*n*((a + b*Log[c*x^n])/(d*(d
+ e*x)) + (a + b*Log[c*x^n])^2/(2*b*d^2*n) - (b*n*(Log[x]/d - Log[d + e*x]/
d))/d - ((a + b*Log[c*x^n])*Log[(d + e*x)/d])/d^2 - (b*n*PolyLog[2, -((e*x)
/d)])/d^2))/e
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$
\text{integral}\left(\frac{b^2\log\left(cx^n\right)^2+2\,ab\log\left(cx^n\right)+a^2}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3},x\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^3*x^3 + 3*d*e^2*x^2
 + 3*d^2*e*x + d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^{n}\right) + a\right)^{2}}{\left(ex + d\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/(e*x + d)^3, x)
```

maple [C] time = 0.28, size = 990, normalized size = 7.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/(e*x+d)^3,x)
```

```
[Out] -1/2*I/e*n/d^2*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I/e*n/d^2*ln(
e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I/e*n/d/(e*x+d)*b^2*P
i*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I/(e*x+d)^2/e*ln(x^n)*b^2*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2-1/2*I/e*n/d/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3+1/2*I/e*
n/d^2*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-1/2*I/e*n/d^2*ln(x)*b^2*Pi*csgn(I*c*
x^n)^3+1/2*I/e*n/d^2*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*b^2/(e*x+
d)^2/e*ln(x^n)^2-1/2*I/(e*x+d)^2/e*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)
+1/2*I/e*n/d^2*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I/e*n/d^2*ln(e*x+
d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I/e*n/d/(e*x+d)*b^2*Pi*csgn(I*c*x
^n)^2*csgn(I*c)-1/8*(-I*Pi*b*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+I*Pi*b*csg
n(I*c)*csgn(I*c*x^n)^2+I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*csgn(I*c*x
^n)^3+2*b*ln(c)+2*a)^2/(e*x+d)^2/e+b^2/e*n^2/d^2*ln(e*x+d)*ln(-1/d*e*x)+1/2
*I/e*n/d/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I/(e*x+d)^2/e*ln(x^
n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*b^2/e*n^2/d^2*ln(x)^2+1/2
*I/(e*x+d)^2/e*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^3-1/2*I/e*n/d^2*ln(x)*b^2*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+b/e*n/d^2*ln(x)*a-b/e*n/d^2*ln(e*x+d)*a+b
/e*n/d/(e*x+d)*a-b^2/e*n^2/d^2*ln(x)+b^2/e*n^2/d^2*dilog(-1/d*e*x)+b^2*n^2*
ln(e*x+d)/e/d^2+b^2/e*n*ln(x^n)/d^2*ln(x)-b^2/e*n*ln(x^n)/d^2*ln(e*x+d)+b^2
/e*n*ln(x^n)/d/(e*x+d)-b/(e*x+d)^2/e*ln(x^n)*a+1/e*n/d^2*ln(x)*b^2*ln(c)-1/
e*n/d^2*ln(e*x+d)*b^2*ln(c)+1/e*n/d/(e*x+d)*b^2*ln(c)-1/(e*x+d)^2/e*ln(x^n)
*b^2*ln(c)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$abn\left(\frac{1}{de^2x + d^2e} - \frac{\log\left(ex + d\right)}{d^2e} + \frac{\log(x)}{d^2e}\right) - \frac{1}{2}\,b^2\left(\frac{\log\left(x^n\right)^2}{e^3x^2 + 2\,de^2x + d^2e} - 2\int \frac{ex\log(c)^2 + \left(dn + \left(en + 2\,e\log(c\right.\right.}{e^4x^4 + 3\,de^3x^3 + 3\,d^2e^2x^2 +}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] a*b*n*(1/(d*e^2*x + d^2*e) - log(e*x + d)/(d^2*e) + log(x)/(d^2*e)) - 1/2*b
^2*(log(x^n)^2/(e^3*x^2 + 2*d*e^2*x + d^2*e) - 2*integrate((e*x*log(c)^2 +
(d*n + (e*n + 2*e*log(c))*x)*log(x^n))/(e^4*x^4 + 3*d*e^3*x^3 + 3*d^2*e^2*x
^2 + d^3*e*x), x)) - a*b*log(c*x^n)/(e^3*x^2 + 2*d*e^2*x + d^2*e) - 1/2*a^2
/(e^3*x^2 + 2*d*e^2*x + d^2*e)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b\ \ln(c\,x^n))^2}{(d + e\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(d + e*x)^3,x)
[Out] int((a + b*log(c*x^n))^2/(d + e*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b\log\left(cx^n\right)\right)^2}{(d + ex)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/(e*x+d)**3,x)
[Out] Integral((a + b*log(c*x**n))**2/(d + e*x)**3, x)
```

3.111 $\int \frac{\left(a+b\log(cx^n)\right)^2}{x(d+ex)^3}\,dx$

Optimal. Leaf size=257

$$-\frac{2bn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{d^3}-\frac{ex\left(a+b\log\left(cx^n\right)\right)^2}{d^3(d+ex)}+\frac{3bn\log\left(\frac{ex}{d}+1\right)\left(a+b\right.}{d^3}$$

```
[Out] b*e*n*x*(a+b*ln(c*x^n))/d^3/(e*x+d)-1/2*(a+b*ln(c*x^n))^2/d^3+1/2*(a+b*ln(c
*x^n))^2/d/(e*x+d)^2-e*x*(a+b*ln(c*x^n))^2/d^3/(e*x+d)+1/3*(a+b*ln(c*x^n))^
3/b/d^3/n-b^2*n^2*ln(e*x+d)/d^3+3*b*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/d^3-(a+b*
ln(c*x^n))^2*ln(1+e*x/d)/d^3+3*b^2*n^2*polylog(2,-e*x/d)/d^3-2*b*n*(a+b*ln(
c*x^n))*polylog(2,-e*x/d)/d^3+2*b^2*n^2*polylog(3,-e*x/d)/d^3
```

Rubi [A] time = 0.59, antiderivative size = 257, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.565, Rules used = {2347, 2344, 2302, 30, 2317, 2374, 6589, 2318, 2391, 2319, 2301, 2314, 31}

$$-\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^3}-\frac{\log\left(\frac{ex}{d}+1\right)\left(a+\right.}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x)^3),x]
```

```
[Out] (b*e*n*x*(a + b*Log[c*x^n]))/(d^3*(d + e*x)) - (a + b*Log[c*x^n])^2/(2*d^3)
 + (a + b*Log[c*x^n])^2/(2*d*(d + e*x)^2) - (e*x*(a + b*Log[c*x^n])^2)/(d^3
*(d + e*x)) + (a + b*Log[c*x^n])^3/(3*b*d^3*n) - (b^2*n^2*Log[d + e*x])/d^3
 + (3*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^3 - ((a + b*Log[c*x^n])^2*
Log[1 + (e*x)/d])/d^3 + (3*b^2*n^2*PolyLog[2, -((e*x)/d)])/d^3 - (2*b*n*(a
+ b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^3 + (2*b^2*n^2*PolyLog[3, -((e*x)
/d)])/d^3
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
```

```
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x(d+ex)^3}\,dx = \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{x(d+ex)^2}\,dx}{d} - \frac{e\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^3}\,dx}{d}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d(d+ex)^2} + \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{x(d+ex)}\,dx}{d^2} - \frac{e\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^2}\,dx}{d^2} - \frac{(bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{d}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d(d+ex)^2} - \frac{ex\left(a+b\log\left(cx^n\right)\right)^2}{d^3(d+ex)} + \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{x}\,dx}{d^3} - \frac{e\int \frac{\left(a+b\log(cx^n)\right)^2}{d+ex}\,dx}{d^3}$$

$$= \frac{benx\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d(d+ex)^2} - \frac{ex\left(a+b\log\left(cx^n\right)\right)^2}{d^3(d+ex)} + \frac{2bn\left(a+b\log\right.}{}$$

$$= \frac{benx\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^3} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d(d+ex)^2} - \frac{ex\left(a+b\log\left(cx^n\right.\right.}{d^3(d+ex)}$$

$$= \frac{benx\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^3} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d(d+ex)^2} - \frac{ex\left(a+b\log\left(cx^n\right.\right.}{d^3(d+ex)}$$

Mathematica [A] time = 0.26, size = 232, normalized size = 0.90

$$\frac{\frac{3d^2\left(a+b\log(cx^n)\right)^2}{(d+ex)^2} - 12bn\operatorname{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right) - 6\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2 + \frac{6d\left(a+b\log(cx^n)\right)^2}{d+ex} + 18bn\log}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x)^3),x]
```

```
[Out] ((-6*b*d*n*(a + b*Log[c*x^n]))/(d + e*x) - 9*(a + b*Log[c*x^n])^2 + (3*d^2*
(a + b*Log[c*x^n])^2)/(d + e*x)^2 + (6*d*(a + b*Log[c*x^n])^2)/(d + e*x) +
(2*(a + b*Log[c*x^n])^3)/(b*n) + 6*b^2*n^2*(Log[x] - Log[d + e*x]) + 18*b*n
*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 6*(a + b*Log[c*x^n])^2*Log[1 + (e*x)
/d] + 18*b^2*n^2*PolyLog[2, -((e*x)/d)] - 12*b*n*(a + b*Log[c*x^n])*PolyLog
[2, -((e*x)/d)] + 12*b^2*n^2*PolyLog[3, -((e*x)/d)])/(6*d^3)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{b^2\log\left(cx^n\right)^2 + 2\,ab\log\left(cx^n\right) + a^2}{e^3x^4 + 3\,de^2x^3 + 3\,d^2ex^2 + d^3x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^3*x^4 + 3*d*e^2*x^3
 + 3*d^2*e*x^2 + d^3*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right) + a\right)^2}{(ex+d)^3x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^3*x), x)
```

maple [F] time = 0.83, size = 0, normalized size = 0.00

$$\int \frac{(b \ln (c\,x^{n})+a)^{2}}{(ex+d)^{3}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x/(e*x+d)^3,x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/x/(e*x+d)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a^{2}\left(\frac{2\,ex+3\,d}{d^{2}e^{2}x^{2}+2\,d^{3}ex+d^{4}}-\frac{2\,\log(ex+d)}{d^{3}}+\frac{2\,\log(x)}{d^{3}}\right)+\int\frac{b^{2}\log(c)^{2}+b^{2}\log(x^{n})^{2}+2\,ab\log(c)+2\left(b^{2}\log(c)\right.}{e^{3}x^{4}+3\,de^{2}x^{3}+3\,d^{2}ex^{2}+d^{3}x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*((2*e*x + 3*d)/(d^2*e^2*x^2 + 2*d^3*e*x + d^4) - 2*log(e*x + d)/d^3
 + 2*log(x)/d^3) + integrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c)
+ 2*(b^2*log(c) + a*b)*log(x^n))/(e^3*x^4 + 3*d*e^2*x^3 + 3*d^2*e*x^2 + d^3
*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\ln(c\,x^{n}))^{2}}{x\,(d+e\,x)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x*(d + e*x)^3),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(x*(d + e*x)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log(cx^{n})\right)^{2}}{x\,(d+ex)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x*(d + e*x)**3), x)
```

3.112 $\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)^3}\,dx$

Optimal. Leaf size=322

$$\frac{2e^2x\left(a+b\log\left(cx^n\right)\right)^2}{d^4(d+ex)}-\frac{be^2nx\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)}+\frac{6ben\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{e\left(a+b\log\left(cx^n\right)\right)^3}{bd^4n}+\frac{e\left(a+\right.}{}$$

```
[Out] -2*b^2*n^2/d^3/x-2*b*n*(a+b*ln(c*x^n))/d^3/x-b*e^2*n*x*(a+b*ln(c*x^n))/d^4/
(e*x+d)+1/2*e*(a+b*ln(c*x^n))^2/d^4-(a+b*ln(c*x^n))^2/d^3/x-1/2*e*(a+b*ln(c
*x^n))^2/d^2/(e*x+d)^2+2*e^2*x*(a+b*ln(c*x^n))^2/d^4/(e*x+d)-e*(a+b*ln(c*x^
n))^3/b/d^4/n+b^2*e*n^2*ln(e*x+d)/d^4-5*b*e*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/d
^4+3*e*(a+b*ln(c*x^n))^2*ln(1+e*x/d)/d^4-5*b^2*e*n^2*polylog(2,-e*x/d)/d^4+
6*b*e*n*(a+b*ln(c*x^n))*polylog(2,-e*x/d)/d^4-6*b^2*e*n^2*polylog(3,-e*x/d)
/d^4
```

Rubi [A] time = 0.54, antiderivative size = 322, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 16, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.696, Rules used = {2353, 2305, 2304, 2302, 30, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 2318, 2374, 6589}

$$\frac{6ben\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{5b^2en^2\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}-\frac{6b^2en^2\mathrm{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^4}+\frac{2e^2x\left(a+b\log\left(\right.\right.}{d^4(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^3),x]
```

```
[Out] (-2*b^2*n^2)/(d^3*x) - (2*b*n*(a + b*Log[c*x^n]))/(d^3*x) - (b*e^2*n*x*(a +
 b*Log[c*x^n]))/(d^4*(d + e*x)) + (e*(a + b*Log[c*x^n])^2)/(2*d^4) - (a + b
*Log[c*x^n])^2/(d^3*x) - (e*(a + b*Log[c*x^n])^2)/(2*d^2*(d + e*x)^2) + (2*
e^2*x*(a + b*Log[c*x^n])^2)/(d^4*(d + e*x)) - (e*(a + b*Log[c*x^n])^3)/(b*d
^4*n) + (b^2*e*n^2*Log[d + e*x])/d^4 - (5*b*e*n*(a + b*Log[c*x^n])*Log[1 +
(e*x)/d])/d^4 + (3*e*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d^4 - (5*b^2*e*
n^2*PolyLog[2, -((e*x)/d)])/d^4 + (6*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -(
(e*x)/d)])/d^4 - (6*b^2*e*n^2*PolyLog[3, -((e*x)/d)])/d^4
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
```

```
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2(d+ex)^3}\,dx = \int \left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^3x^2} - \frac{3e\left(a+b\log\left(cx^n\right)\right)^2}{d^4x} + \frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{d^2(d+ex)^3} + \frac{2e^2\left(a+b\log\right.}{d^3(d+}\right.$$

$$= \frac{\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\,dx}{d^3} - \frac{(3e)\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx}{d^4} + \frac{\left(3e^2\right)\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx}{d^4} + \frac{\left(2e^2\right)\int \frac{(a+}{}}{}$$

$$= -\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^3x} - \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2d^2(d+ex)^2} + \frac{2e^2x\left(a+b\log\left(cx^n\right)\right)^2}{d^4(d+ex)} + \frac{3e\left(a+b\log\right.}{}$$

$$= -\frac{2b^2n^2}{d^3x} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)}{d^3x} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^3x} - \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2d^2(d+ex)^2} + \frac{2e^2x\left(\right.}{}$$

$$= -\frac{2b^2n^2}{d^3x} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)}{d^3x} - \frac{be^2nx\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^3x} - \frac{e\left(\right.}{}$$

$$= -\frac{2b^2n^2}{d^3x} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)}{d^3x} - \frac{be^2nx\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)} + \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2d^4} - \frac{\left(\right.}{}$$

$$= -\frac{2b^2n^2}{d^3x} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)}{d^3x} - \frac{be^2nx\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)} + \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2d^4} - \frac{\left(\right.}{}$$

Mathematica [A] time = 0.41, size = 290, normalized size = 0.90

$$-\frac{\frac{d^2e\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2} - 12ben\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right) - 6e\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2 + \frac{4de\left(a+b\log\left(cx^n\right)\right)^2}{d+ex} + 10b}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^3),x]
```

```
[Out] -1/2*((4*b^2*d*n^2)/x + (4*b*d*n*(a + b*Log[c*x^n]))/x - (2*b*d*e*n*(a + b*
Log[c*x^n]))/(d + e*x) - 5*e*(a + b*Log[c*x^n])^2 + (2*d*(a + b*Log[c*x^n])
^2)/x + (d^2*e*(a + b*Log[c*x^n])^2)/(d + e*x)^2 + (4*d*e*(a + b*Log[c*x^n]
)^2)/(d + e*x) + (2*e*(a + b*Log[c*x^n])^3)/(b*n) + 2*b^2*e*n^2*(Log[x] - L
og[d + e*x]) + 10*b*e*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 6*e*(a + b*Lo
g[c*x^n])^2*Log[1 + (e*x)/d] + 10*b^2*e*n^2*PolyLog[2, -((e*x)/d)] - 12*b*e
*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 12*b^2*e*n^2*PolyLog[3, -((e
*x)/d)])/d^4
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\log\left(cx^n\right)^2 + 2\,ab\log\left(cx^n\right) + a^2}{e^3x^5 + 3\,de^2x^4 + 3\,d^2ex^3 + d^3x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^3*x^5 + 3*d*e^2*x^4
 + 3*d^2*e*x^3 + d^3*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right) + a\right)^2}{(ex + d)^3x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^3*x^2), x)
```

maple [F] time = 0.77, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right) + a\right)^2}{(ex + d)^3\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x^2/(e*x+d)^3,x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/x^2/(e*x+d)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a^2\left(\frac{6\,e^2x^2 + 9\,dex + 2\,d^2}{d^3e^2x^3 + 2\,d^4ex^2 + d^5x} - \frac{6\,e\log\left(ex + d\right)}{d^4} + \frac{6\,e\log(x)}{d^4}\right) + \int \frac{b^2\log(c)^2 + b^2\log\left(x^n\right)^2 + 2\,ab\log(c) + 2\left(b^2 l\right.}{e^3x^5 + 3\,de^2x^4 + 3\,d^2ex^3 + d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*((6*e^2*x^2 + 9*d*e*x + 2*d^2)/(d^3*e^2*x^3 + 2*d^4*e*x^2 + d^5*x)
 - 6*e*log(e*x + d)/d^4 + 6*e*log(x)/d^4) + integrate((b^2*log(c)^2 + b^2*l
og(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e^3*x^5 + 3*d*e^
2*x^4 + 3*d^2*e*x^3 + d^3*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a + b\,\ln\left(c\,x^n\right)\right)^2}{x^2\,\left(d + e\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x^2*(d + e*x)^3),x)
[Out] int((a + b*log(c*x^n))^2/(x^2*(d + e*x)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^{n}\right)\right)^{2}}{x^{2}\left(d+ex\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**2/(e*x+d)**3,x)
[Out] Integral((a + b*log(c*x**n))**2/(x**2*(d + e*x)**3), x)
```

3.113 $\int \frac{x^4(a+b\log(cx^n))^2}{(d+ex)^4} dx$

Optimal. Leaf size=398

$$-\frac{d^4 (a+b\log(cx^n))^2}{3e^5(d+ex)^3}+\frac{2d^3 (a+b\log(cx^n))^2}{e^5(d+ex)^2}+\frac{bd^3n (a+b\log(cx^n))}{3e^5(d+ex)^2}-\frac{8bdn\mathrm{Li}_2\left(-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^5}-\frac{5d (a+b}{}$$

```
[Out] -2*a*b*n*x/e^4+2*b^2*n^2*x/e^4-1/3*b^2*d^2*n^2/e^5/(e*x+d)-1/3*b^2*d*n^2*ln
(x)/e^5-2*b^2*n*x*ln(c*x^n)/e^4+1/3*b*d^3*n*(a+b*ln(c*x^n))/e^5/(e*x+d)^2+1
0/3*b*d*n*x*(a+b*ln(c*x^n))/e^4/(e*x+d)-5/3*d*(a+b*ln(c*x^n))^2/e^5+x*(a+b*
ln(c*x^n))^2/e^4-1/3*d^4*(a+b*ln(c*x^n))^2/e^5/(e*x+d)^3+2*d^3*(a+b*ln(c*x^
n))^2/e^5/(e*x+d)^2+6*d*x*(a+b*ln(c*x^n))^2/e^4/(e*x+d)-3*b^2*d*n^2*ln(e*x+
d)/e^5-26/3*b*d*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/e^5-4*d*(a+b*ln(c*x^n))^2*ln(
1+e*x/d)/e^5-26/3*b^2*d*n^2*polylog(2,-e*x/d)/e^5-8*b*d*n*(a+b*ln(c*x^n))*p
olylog(2,-e*x/d)/e^5+8*b^2*d*n^2*polylog(3,-e*x/d)/e^5
```

Rubi [A] time = 0.83, antiderivative size = 398, normalized size of antiderivative = 1.00, number of steps used = 31, number of rules used = 15, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.652$, Rules used = {2353, 2296, 2295, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44, 2318, 2374, 6589}

$$-\frac{8bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^5}-\frac{26b^2dn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3e^5}+\frac{8b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^5}-\frac{d^4 (a+b\log(c}{3e^5(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] (-2*a*b*n*x)/e^4 + (2*b^2*n^2*x)/e^4 - (b^2*d^2*n^2)/(3*e^5*(d + e*x)) - (b
^2*d*n^2*Log[x])/(3*e^5) - (2*b^2*n*x*Log[c*x^n])/e^4 + (b*d^3*n*(a + b*Log
[c*x^n]))/(3*e^5*(d + e*x)^2) + (10*b*d*n*x*(a + b*Log[c*x^n]))/(3*e^4*(d +
 e*x)) - (5*d*(a + b*Log[c*x^n])^2)/(3*e^5) + (x*(a + b*Log[c*x^n])^2)/e^4
- (d^4*(a + b*Log[c*x^n])^2)/(3*e^5*(d + e*x)^3) + (2*d^3*(a + b*Log[c*x^n]
)^2)/(e^5*(d + e*x)^2) + (6*d*x*(a + b*Log[c*x^n])^2)/(e^4*(d + e*x)) - (3*
b^2*d*n^2*Log[d + e*x])/e^5 - (26*b*d*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d]
)/(3*e^5) - (4*d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^5 - (26*b^2*d*n^2
*PolyLog[2, -((e*x)/d)])/(3*e^5) - (8*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -
((e*x)/d)])/e^5 + (8*b^2*d*n^2*PolyLog[3, -((e*x)/d)])/e^5
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
```

```
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^4 \left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^4}\,dx = \int \left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{e^4}+\frac{d^4\left(a+b\log\left(cx^n\right)\right)^2}{e^4(d+ex)^4}-\frac{4d^3\left(a+b\log\left(cx^n\right)\right)^2}{e^4(d+ex)^3}+\frac{6d^2\left(a+b\right.}{e^4(d\right.}$$

$$=\frac{\int\left(a+b\log\left(cx^n\right)\right)^2\,dx}{e^4}-\frac{(4d)\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx}{e^4}+\frac{\left(6d^2\right)\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}\,dx}{e^4}-\frac{\left(4d^3\right)}{}$$

$$=\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e^4}-\frac{d^4\left(a+b\log\left(cx^n\right)\right)^2}{3e^5(d+ex)^3}+\frac{2d^3\left(a+b\log\left(cx^n\right)\right)^2}{e^5(d+ex)^2}+\frac{6dx\left(a+b\log\right.}{e^4(d+}$$

$$=-\frac{2abnx}{e^4}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{e^4}-\frac{d^4\left(a+b\log\left(cx^n\right)\right)^2}{3e^5(d+ex)^3}+\frac{2d^3\left(a+b\log\left(cx^n\right)\right)^2}{e^5(d+ex)^2}+\frac{6d}{}$$

$$=-\frac{2abnx}{e^4}+\frac{2b^2n^2x}{e^4}-\frac{2b^2nx\log\left(cx^n\right)}{e^4}+\frac{bd^3n\left(a+b\log\left(cx^n\right)\right)}{3e^5(d+ex)^2}+\frac{4bdnx\left(a+b\log\right.}{e^4(d+ex)}$$

$$=-\frac{2abnx}{e^4}+\frac{2b^2n^2x}{e^4}-\frac{2b^2nx\log\left(cx^n\right)}{e^4}+\frac{bd^3n\left(a+b\log\left(cx^n\right)\right)}{3e^5(d+ex)^2}+\frac{10bdnx\left(a+b\log\right.}{3e^4(d+ex)}$$

$$=-\frac{2abnx}{e^4}+\frac{2b^2n^2x}{e^4}-\frac{b^2d^2n^2}{3e^5(d+ex)}-\frac{b^2dn^2\log(x)}{3e^5}-\frac{2b^2nx\log\left(cx^n\right)}{e^4}+\frac{bd^3n\left(a+b\log\right.}{3e^5(d+}$$

$$=-\frac{2abnx}{e^4}+\frac{2b^2n^2x}{e^4}-\frac{b^2d^2n^2}{3e^5(d+ex)}-\frac{b^2dn^2\log(x)}{3e^5}-\frac{2b^2nx\log\left(cx^n\right)}{e^4}+\frac{bd^3n\left(a+b\log\right.}{3e^5(d+}$$

Mathematica [A] time = 0.65, size = 344, normalized size = 0.86

$$-\frac{\frac{d^4\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^3}-\frac{6d^3\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}-\frac{bd^3n\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2}+\frac{18d^2\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}+\frac{10bd^2n\left(a+b\log\left(cx^n\right)\right)}{d+ex}+24bdn\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] -1/3*(-((b*d^3*n*(a + b*Log[c*x^n]))/(d + e*x)^2) + (10*b*d^2*n*(a + b*Log[
c*x^n]))/(d + e*x) - 13*d*(a + b*Log[c*x^n])^2 - 3*e*x*(a + b*Log[c*x^n])^2
 + (d^4*(a + b*Log[c*x^n])^2)/(d + e*x)^3 - (6*d^3*(a + b*Log[c*x^n])^2)/(d
 + e*x)^2 + (18*d^2*(a + b*Log[c*x^n])^2)/(d + e*x) + 6*b*e*n*x*(a - b*n +
b*Log[c*x^n]) - 10*b^2*d*n^2*(Log[x] - Log[d + e*x]) + (b^2*d*n^2*(d + (d +
 e*x)*Log[x] - (d + e*x)*Log[d + e*x]))/(d + e*x) + 26*b*d*n*(a + b*Log[c*x
^n])*Log[1 + (e*x)/d] + 12*d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 26*b^2
*d*n^2*PolyLog[2, -((e*x)/d)] + 24*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -((e
*x)/d)] - 24*b^2*d*n^2*PolyLog[3, -((e*x)/d)])/e^5
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2x^4\log\left(cx^n\right)^2+2\,abx^4\log\left(cx^n\right)+a^2x^4}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^4*log(c*x^n)^2 + 2*a*b*x^4*log(c*x^n) + a^2*x^4)/(e^4*x^4 +
 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^2x^4}{\left(ex+d\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^4/(e*x + d)^4, x)
```

maple [F] time = 0.89, size = 0, normalized size = 0.00

$$\int\frac{\left(b\ln\left(c\,x^n\right)+a\right)^2x^4}{\left(ex+d\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(b*ln(c*x^n)+a)^2/(e*x+d)^4,x)
```

```
[Out] int(x^4*(b*ln(c*x^n)+a)^2/(e*x+d)^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}\,a^2\left(\frac{18\,d^2e^2x^2+30\,d^3ex+13\,d^4}{e^8x^3+3\,de^7x^2+3\,d^2e^6x+d^3e^5}-\frac{3\,x}{e^4}+\frac{12\,d\log\left(ex+d\right)}{e^5}\right)+\int\frac{b^2x^4\log\left(x^n\right)^2+2\left(b^2\log(c)+ab\right)x^4\log}{e^4x^4+4\,de^3x^3+6\,d^2e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] -1/3*a^2*((18*d^2*e^2*x^2 + 30*d^3*e*x + 13*d^4)/(e^8*x^3 + 3*d*e^7*x^2 + 3
*d^2*e^6*x + d^3*e^5) - 3*x/e^4 + 12*d*log(e*x + d)/e^5) + integrate((b^2*x
^4*log(x^n)^2 + 2*(b^2*log(c) + a*b)*x^4*log(x^n) + (b^2*log(c)^2 + 2*a*b*l
og(c))*x^4)/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^4\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2}{{\left(d+e\,x\right)}^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*log(c*x^n))^2)/(d + e*x)^4,x)
```

```
[Out] int((x^4*(a + b*log(c*x^n))^2)/(d + e*x)^4, x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4 \left(a + b \log\left(cx^n\right)\right)^2}{\left(d + ex\right)^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))**2/(e*x+d)**4,x)
```

```
[Out] Integral(x**4*(a + b*log(c*x**n))**2/(d + e*x)**4, x)
```

3.114 $\int \frac{x^3(a+b\log(cx^n))^2}{(d+ex)^4}\,dx$

Optimal. Leaf size=333

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{3e^4(d+ex)^3}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^4(d+ex)^2}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{3e^4(d+ex)^2}+\frac{2bn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{\log\left(\frac{ex}{d}\right.}{}$$

```
[Out] 1/3*b^2*d*n^2/e^4/(e*x+d)+1/3*b^2*n^2*ln(x)/e^4-1/3*b*d^2*n*(a+b*ln(c*x^n))
/e^4/(e*x+d)^2-7/3*b*n*x*(a+b*ln(c*x^n))/e^3/(e*x+d)+7/6*(a+b*ln(c*x^n))^2/
e^4+1/3*d^3*(a+b*ln(c*x^n))^2/e^4/(e*x+d)^3-3/2*d^2*(a+b*ln(c*x^n))^2/e^4/(
e*x+d)^2-3*x*(a+b*ln(c*x^n))^2/e^3/(e*x+d)+2*b^2*n^2*ln(e*x+d)/e^4+11/3*b*n
*(a+b*ln(c*x^n))*ln(1+e*x/d)/e^4+(a+b*ln(c*x^n))^2*ln(1+e*x/d)/e^4+11/3*b^2
*n^2*polylog(2,-e*x/d)/e^4+2*b*n*(a+b*ln(c*x^n))*polylog(2,-e*x/d)/e^4-2*b^
2*n^2*polylog(3,-e*x/d)/e^4
```

Rubi [A] time = 0.79, antiderivative size = 333, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 13, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.565, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44, 2318, 2374, 6589}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{11b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3e^4}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}+\frac{d^3\left(a+b\log\left(cx^n\right)\right.}{3e^4(d+ex)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] (b^2*d*n^2)/(3*e^4*(d + e*x)) + (b^2*n^2*Log[x])/(3*e^4) - (b*d^2*n*(a + b*
Log[c*x^n]))/(3*e^4*(d + e*x)^2) - (7*b*n*x*(a + b*Log[c*x^n]))/(3*e^3*(d +
 e*x)) + (7*(a + b*Log[c*x^n])^2)/(6*e^4) + (d^3*(a + b*Log[c*x^n])^2)/(3*e
^4*(d + e*x)^3) - (3*d^2*(a + b*Log[c*x^n])^2)/(2*e^4*(d + e*x)^2) - (3*x*(
a + b*Log[c*x^n])^2)/(e^3*(d + e*x)) + (2*b^2*n^2*Log[d + e*x])/e^4 + (11*b
*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(3*e^4) + ((a + b*Log[c*x^n])^2*Log
[1 + (e*x)/d])/e^4 + (11*b^2*n^2*PolyLog[2, -((e*x)/d)])/(3*e^4) + (2*b*n*(
a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^4 - (2*b^2*n^2*PolyLog[3, -((e*
x)/d)])/e^4
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
```

```
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
```

```
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3 \left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^4}\,dx = \int \left(-\frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)^4}+\frac{3d^2\left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)^3}-\frac{3d\left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)^2}+\frac{(a\right.$$

$$=\frac{\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx}{e^3}-\frac{(3d)\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}\,dx}{e^3}+\frac{\left(3d^2\right)\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^3}\,dx}{e^3}-\frac{d^3\int\frac{(a+}{}}{}$$

$$=\frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{3e^4(d+ex)^3}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^4(d+ex)^2}-\frac{3x\left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)}+\frac{\left(a+b\log\right.}{}$$

$$=\frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{3e^4(d+ex)^3}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^4(d+ex)^2}-\frac{3x\left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)}+\frac{6bn\left(a+\right.}{}$$

$$=-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{3e^4(d+ex)^2}-\frac{3bnx\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)}+\frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{3e^4(d+ex)^3}-\frac{3d^2\left(\right.}{2}$$

$$=-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{3e^4(d+ex)^2}-\frac{7bnx\left(a+b\log\left(cx^n\right)\right)}{3e^3(d+ex)}+\frac{3\left(a+b\log\left(cx^n\right)\right)^2}{2e^4}+\frac{d^3\left(a\right.}{3e}$$

$$=\frac{b^2dn^2}{3e^4(d+ex)}+\frac{b^2n^2\log(x)}{3e^4}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{3e^4(d+ex)^2}-\frac{7bnx\left(a+b\log\left(cx^n\right)\right)}{3e^3(d+ex)}+\frac{7}{}$$

$$=\frac{b^2dn^2}{3e^4(d+ex)}+\frac{b^2n^2\log(x)}{3e^4}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{3e^4(d+ex)^2}-\frac{7bnx\left(a+b\log\left(cx^n\right)\right)}{3e^3(d+ex)}+\frac{7}{}$$

Mathematica [A] time = 0.50, size = 298, normalized size = 0.89

$$\frac{\frac{2d^3\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^3}-\frac{9d^2\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2}-\frac{2bd^2n\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2}+12bn\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{18d\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}+\frac{14bd}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] ((-2*b*d^2*n*(a + b*Log[c*x^n]))/(d + e*x)^2 + (14*b*d*n*(a + b*Log[c*x^n])
)/(d + e*x) - 11*(a + b*Log[c*x^n])^2 + (2*d^3*(a + b*Log[c*x^n])^2)/(d + e
*x)^3 - (9*d^2*(a + b*Log[c*x^n])^2)/(d + e*x)^2 + (18*d*(a + b*Log[c*x^n])
^2)/(d + e*x) - 14*b^2*n^2*(Log[x] - Log[d + e*x]) + (2*b^2*n^2*(d + (d + e
*x)*Log[x] - (d + e*x)*Log[d + e*x]))/(d + e*x) + 22*b*n*(a + b*Log[c*x^n])
*Log[1 + (e*x)/d] + 6*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 22*b^2*n^2*Po
lyLog[2, -((e*x)/d)] + 12*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - 1
2*b^2*n^2*PolyLog[3, -((e*x)/d)])/(6*e^4)
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^3\log\left(cx^n\right)^2+2\,abx^3\log\left(cx^n\right)+a^2x^3}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*log(c*x^n)^2 + 2*a*b*x^3*log(c*x^n) + a^2*x^3)/(e^4*x^4 +
 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log\left(cx^{n}\right) + a\right)^{2} x^{3}}{(ex + d)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^3/(e*x + d)^4, x)
```

maple [F] time = 0.86, size = 0, normalized size = 0.00

$$\int \frac{\left(b \ln\left(c\, x^{n}\right) + a\right)^{2} x^{3}}{(ex + d)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)^2/(e*x+d)^4,x)
```

```
[Out] int(x^3*(b*ln(c*x^n)+a)^2/(e*x+d)^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{6}\, a^{2}\left(\frac{18\, de^{2}x^{2} + 27\, d^{2}ex + 11\, d^{3}}{e^{7}x^{3} + 3\, de^{6}x^{2} + 3\, d^{2}e^{5}x + d^{3}e^{4}} + \frac{6\, \log\left(ex + d\right)}{e^{4}}\right) + \int \frac{b^{2}x^{3}\log\left(x^{n}\right)^{2} + 2\left(b^{2}\log(c) + ab\right)x^{3}\log\left(x^{n}\right) + \left(b^{2}\,\mathrm{lc}\right.}{e^{4}x^{4} + 4\, de^{3}x^{3} + 6\, d^{2}e^{2}x^{2} + 4\, d^{3}ex}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/6*a^2*((18*d*e^2*x^2 + 27*d^2*e*x + 11*d^3)/(e^7*x^3 + 3*d*e^6*x^2 + 3*d^
2*e^5*x + d^3*e^4) + 6*log(e*x + d)/e^4) + integrate((b^2*x^3*log(x^n)^2 +
2*(b^2*log(c) + a*b)*x^3*log(x^n) + (b^2*log(c)^2 + 2*a*b*log(c))*x^3)/(e^4
*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^{3}\left(a + b\, \ln\left(c\, x^{n}\right)\right)^{2}}{\left(d + e\, x\right)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n))^2)/(d + e*x)^4,x)
```

```
[Out] int((x^3*(a + b*log(c*x^n))^2)/(d + e*x)^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3}\left(a + b \log\left(cx^{n}\right)\right)^{2}}{(d + ex)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))**2/(e*x+d)**4,x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))**2/(d + e*x)**4, x)
```

3.115 $\int \frac{x^2(a+b\log(cx^n))^2}{(d+ex)^4}\,dx$

Optimal. Leaf size=161

$$-\frac{bn\log\left(\frac{ex}{d}+1\right)\left(2a+2b\log\left(cx^n\right)+3bn\right)}{3de^3}+\frac{bnx\left(2a+2b\log\left(cx^n\right)+bn\right)}{3de^2(d+ex)}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)^2}{3d(d+ex)^3}+\frac{bnx^2\left(a+b\right.}{3de(d+}$$

```
[Out] 1/3*b*n*x^2*(a+b*ln(c*x^n))/d/e/(e*x+d)^2+1/3*x^3*(a+b*ln(c*x^n))^2/d/(e*x+
d)^3+1/3*b*n*x*(2*a+b*n+2*b*ln(c*x^n))/d/e^2/(e*x+d)-1/3*b*n*(2*a+3*b*n+2*b
*ln(c*x^n))*ln(1+e*x/d)/d/e^3-2/3*b^2*n^2*polylog(2,-e*x/d)/d/e^3
```

Rubi [A] time = 0.72, antiderivative size = 274, normalized size of antiderivative = 1.70, number of steps used = 25, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44, 2318}

$$-\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3de^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{3e^3(d+ex)^3}+\frac{4bnx\left(a+b\log\left(cx^n\right)\right)}{3de^2(d+ex)}+\frac{bdn\left(a+b\log\left(cx^n\right)\right)}{3e^3(d+ex)^2}-\frac{2bn\log\left(\frac{ex}{d}+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] -(b^2*n^2)/(3*e^3*(d + e*x)) - (b^2*n^2*Log[x])/(3*d*e^3) + (b*d*n*(a + b*L
og[c*x^n]))/(3*e^3*(d + e*x)^2) + (4*b*n*x*(a + b*Log[c*x^n]))/(3*d*e^2*(d
+ e*x)) - (2*(a + b*Log[c*x^n])^2)/(3*d*e^3) - (d^2*(a + b*Log[c*x^n])^2)/(
3*e^3*(d + e*x)^3) + (d*(a + b*Log[c*x^n])^2)/(e^3*(d + e*x)^2) + (x*(a + b
*Log[c*x^n])^2)/(d*e^2*(d + e*x)) - (b^2*n^2*Log[d + e*x])/(d*e^3) - (2*b*n
*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(3*d*e^3) - (2*b^2*n^2*PolyLog[2, -((
e*x)/d)])/(3*d*e^3)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
```

```
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2 \left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^4}\,dx = \int \left(\frac{d^2 \left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)^4} - \frac{2d \left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)^3} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{e^2(d+ex)^2}\right) dx$$

$$= \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^2}\,dx}{e^2} - \frac{(2d)\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^3}\,dx}{e^2} + \frac{d^2 \int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^4}\,dx}{e^2}$$

$$= -\frac{d^2 \left(a+b\log\left(cx^n\right)\right)^2}{3e^3(d+ex)^3} + \frac{d \left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)^2} + \frac{x \left(a+b\log\left(cx^n\right)\right)^2}{de^2(d+ex)} - \frac{(2bdn)\int \frac{a}{}}{}$$

$$= -\frac{d^2 \left(a+b\log\left(cx^n\right)\right)^2}{3e^3(d+ex)^3} + \frac{d \left(a+b\log\left(cx^n\right)\right)^2}{e^3(d+ex)^2} + \frac{x \left(a+b\log\left(cx^n\right)\right)^2}{de^2(d+ex)} - \frac{2bn \left(a+b\right.}{}$$

$$= \frac{bdn \left(a+b\log\left(cx^n\right)\right)}{3e^3(d+ex)^2} + \frac{2bnx \left(a+b\log\left(cx^n\right)\right)}{de^2(d+ex)} - \frac{d^2 \left(a+b\log\left(cx^n\right)\right)^2}{3e^3(d+ex)^3} + \frac{d \left(a+b\right.}{e^3(}$$

$$= \frac{bdn \left(a+b\log\left(cx^n\right)\right)}{3e^3(d+ex)^2} + \frac{4bnx \left(a+b\log\left(cx^n\right)\right)}{3de^2(d+ex)} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{de^3} - \frac{d^2 \left(a+b\,\mathrm{lc}\right.}{3e^3(d-}$$

$$= -\frac{b^2n^2}{3e^3(d+ex)} - \frac{b^2n^2\log(x)}{3de^3} + \frac{bdn \left(a+b\log\left(cx^n\right)\right)}{3e^3(d+ex)^2} + \frac{4bnx \left(a+b\log\left(cx^n\right)\right)}{3de^2(d+ex)} - \frac{2}{}$$

$$= -\frac{b^2n^2}{3e^3(d+ex)} - \frac{b^2n^2\log(x)}{3de^3} + \frac{bdn \left(a+b\log\left(cx^n\right)\right)}{3e^3(d+ex)^2} + \frac{4bnx \left(a+b\log\left(cx^n\right)\right)}{3de^2(d+ex)} - \frac{2}{}$$

Mathematica [B] time = 0.51, size = 371, normalized size = 2.30

$$-\frac{\frac{a^2d^2}{(d+ex)^3} + \frac{3a^2}{d+ex} - \frac{3a^2d}{(d+ex)^2} - \frac{a^2}{d} + \frac{2abd^2\log(cx^n)}{(d+ex)^3} + \frac{6ab\log(cx^n)}{d+ex} - \frac{6abd\log(cx^n)}{(d+ex)^2} - \frac{2ab\log(cx^n)}{d} + \frac{4abn}{d+ex} - \frac{abdn}{(d+ex)^2} + \frac{2abn\log\left(\frac{ex}{d}+\right.}{d}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] -1/3*(-(a^2/d) + (a^2*d^2)/(d + e*x)^3 - (3*a^2*d)/(d + e*x)^2 - (a*b*d*n)/
(d + e*x)^2 + (3*a^2)/(d + e*x) + (4*a*b*n)/(d + e*x) + (b^2*n^2)/(d + e*x)
 - (3*b^2*n^2*Log[x])/d - (2*a*b*Log[c*x^n])/d + (2*a*b*d^2*Log[c*x^n])/(d
+ e*x)^3 - (6*a*b*d*Log[c*x^n])/(d + e*x)^2 - (b^2*d*n*Log[c*x^n])/(d + e*x
)^2 + (6*a*b*Log[c*x^n])/(d + e*x) + (4*b^2*n*Log[c*x^n])/(d + e*x) - (b^2*
Log[c*x^n]^2)/d + (b^2*d^2*Log[c*x^n]^2)/(d + e*x)^3 - (3*b^2*d*Log[c*x^n]^
2)/(d + e*x)^2 + (3*b^2*Log[c*x^n]^2)/(d + e*x) + (3*b^2*n^2*Log[d + e*x])/
d + (2*a*b*n*Log[1 + (e*x)/d])/d + (2*b^2*n*Log[c*x^n]*Log[1 + (e*x)/d])/d
+ (2*b^2*n^2*PolyLog[2, -((e*x)/d)])/d)/e^3
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2x^2\log\left(cx^n\right)^2 + 2\,abx^2\log\left(cx^n\right) + a^2x^2}{e^4x^4 + 4\,de^3x^3 + 6\,d^2e^2x^2 + 4\,d^3ex + d^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*log(c*x^n)^2 + 2*a*b*x^2*log(c*x^n) + a^2*x^2)/(e^4*x^4 +
 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)^{2}x^{2}}{\left(ex+d\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^2/(e*x + d)^4, x)
```

maple [C] time = 0.31, size = 1658, normalized size = 10.30

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)^2/(e*x+d)^4,x)
```

```
[Out] -1/3*I/e^3*n/d*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/3*I/e^3*n
/d*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-1/6*I/e^3*n*d/(e*x+d)^2*b^2*Pi*csgn(I*c
*x^n)^3-1/3*I/e^3*n/d*ln(x)*b^2*Pi*csgn(I*c*x^n)^3+1/3*I*ln(x^n)*d^2/e^3/(e
*x+d)^3*b^2*Pi*csgn(I*c*x^n)^3-2/3*I/e^3*n/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(
I*c*x^n)^2-2/3*I/e^3*n/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-I/e^3*ln(x^
n)/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/e^3*ln(x^n)*d/(e*x+d)^2*b^2
*Pi*csgn(I*c*x^n)^3-b^2*ln(x^n)^2/e^3/(e*x+d)+1/4*(-I*Pi*b*csgn(I*c)*csgn(I
*x^n)*csgn(I*c*x^n)+I*Pi*b*csgn(I*c)*csgn(I*c*x^n)^2+I*Pi*b*csgn(I*x^n)*csg
n(I*c*x^n)^2-I*Pi*b*csgn(I*c*x^n)^3+2*b*ln(c)+2*a)^2*(d/e^3/(e*x+d)^2-1/e^3
/(e*x+d)-1/3*d^2/e^3/(e*x+d)^3)-2/3*ln(x^n)*d^2/e^3/(e*x+d)^3*b^2*ln(c)-1/3
*b^2/e^3*n^2/(e*x+d)-4/3*b/e^3*n/(e*x+d)*a-I/e^3*ln(x^n)/(e*x+d)*b^2*Pi*csg
n(I*c*x^n)^2*csgn(I*c)+1/3*I/e^3*n/d*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)
^2+2/3*I/e^3*n/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I/e^3
*n*d/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/3*I/e^3*n/d*ln(
e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/e^3*ln(x^n)/(e*x+d)*b^2
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/e^3*ln(x^n)*d/(e*x+d)^2*b^2*Pi*cs
gn(I*c*x^n)^2*csgn(I*c)+1/6*I/e^3*n*d/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2+1/6*I/e^3*n*d/(e*x+d)^2*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/3*I*ln(x
^n)*d^2/e^3/(e*x+d)^3*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/3*I*ln(x^n)*d^2/
e^3/(e*x+d)^3*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/3*I/e^3*n/d*ln(e*x+d)*b^2*
Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/3*I/e^3*n/d*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)
^2*csgn(I*c)+I/e^3*ln(x^n)/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3+2/3*I/e^3*n/(e*x+
d)*b^2*Pi*csgn(I*c*x^n)^3+1/3*I/e^3*n/d*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I
*c)-2/3*b/e^3*n/d*ln(e*x+d)*a+2/3/e^3*n/d*ln(x)*b^2*ln(c)-2/3/e^3*n/d*ln(e*
x+d)*b^2*ln(c)+1/3/e^3*n*d/(e*x+d)^2*b^2*ln(c)+2/e^3*ln(x^n)*d/(e*x+d)^2*b^
2*ln(c)+2/3*b^2/e^3*n^2/d*dilog(-1/d*e*x)+b^2/e^3*n^2/d*ln(x)-b^2/e^3*n^2/d
*ln(e*x+d)-1/3*b^2/e^3*n^2*ln(x)^2/d+I/e^3*ln(x^n)*d/(e*x+d)^2*b^2*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2-4/3/e^3*n/(e*x+d)*b^2*ln(c)-1/3*b^2*ln(x^n)^2*d^2/e^
3/(e*x+d)^3-4/3*b^2*n/e^3*ln(x^n)/(e*x+d)+b^2*ln(x^n)^2*d/e^3/(e*x+d)^2-2*b
/e^3*ln(x^n)/(e*x+d)*a-2/e^3*ln(x^n)/(e*x+d)*b^2*ln(c)+1/3*b/e^3*n*d/(e*x+d
)^2*a+2/3*b/e^3*n/d*ln(x)*a+2*b/e^3*ln(x^n)*d/(e*x+d)^2*a-2/3*b^2*n/e^3*ln(
x^n)/d*ln(e*x+d)-2/3*b*ln(x^n)*d^2/e^3/(e*x+d)^3*a+2/3*b^2*n/e^3*ln(x^n)/d*
ln(x)+1/3*b^2*n/e^3*ln(x^n)*d/(e*x+d)^2+1/3*I*ln(x^n)*d^2/e^3/(e*x+d)^3*b^2
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I/e^3*ln(x^n)*d/(e*x+d)^2*b^2*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2/3*b^2/e^3*n^2/d*ln(e*x+d)*ln(-1/d*e*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}\,abn\left(\frac{4\,ex+3\,d}{e^{5}x^{2}+2\,de^{4}x+d^{2}e^{3}}+\frac{2\,\log\left(ex+d\right)}{de^{3}}-\frac{2\,\log(x)}{de^{3}}\right)-\frac{1}{3}\left(\frac{\left(3\,e^{2}x^{2}+3\,dex+d^{2}\right)\log\left(x^{n}\right)^{2}}{e^{6}x^{3}+3\,de^{5}x^{2}+3\,d^{2}e^{4}x+d^{3}e^{3}}-3\int\frac{3\,e^{3}x^{3}\log}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] -1/3*a*b*n*((4*e*x + 3*d)/(e^5*x^2 + 2*d*e^4*x + d^2*e^3) + 2*log(e*x + d)/
(d*e^3) - 2*log(x)/(d*e^3)) - 1/3*((3*e^2*x^2 + 3*d*e*x + d^2)*log(x^n)^2/(
e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3) - 3*integrate(1/3*(3*e^3*x^3
*log(c)^2 + 2*(6*d*e^2*n*x^2 + 4*d^2*e*n*x + d^3*n + 3*(e^3*n + e^3*log(c))
*x^3)*log(x^n))/(e^7*x^5 + 4*d*e^6*x^4 + 6*d^2*e^5*x^3 + 4*d^3*e^4*x^2 + d^
4*e^3*x), x))*b^2 - 2/3*(3*e^2*x^2 + 3*d*e*x + d^2)*a*b*log(c*x^n)/(e^6*x^3
 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3) - 1/3*(3*e^2*x^2 + 3*d*e*x + d^2)*a
^2/(e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2}{{\left(d+e\,x\right)}^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n))^2)/(d + e*x)^4,x)
```

```
[Out] int((x^2*(a + b*log(c*x^n))^2)/(d + e*x)^4, x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2} \left(a + b \log{\left(c x^{n} \right)}\right)^{2}}{\left(d + e x\right)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))**2/(e*x+d)**4,x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))**2/(d + e*x)**4, x)
```

3.116 $\int \frac{x\left(a+b\log(cx^n)\right)^2}{(d+ex)^4}\,dx$

Optimal. Leaf size=210

$$-\frac{bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{3d^2e^2}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{6d^2e^2}+\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3de^2(d+ex)}-\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^2}-\frac{\left(a+b\log\left(cx^n\right.\right.}{2e^2(d+ex)^2}$$

```
[Out] 1/3*b^2*n^2/d/e^2/(e*x+d)-1/3*b*n*(a+b*ln(c*x^n))/e^2/(e*x+d)^2+1/3*b*n*(a+
b*ln(c*x^n))/d/e^2/(e*x+d)+1/6*(a+b*ln(c*x^n))^2/d^2/e^2+1/3*d*(a+b*ln(c*x^
n))^2/e^2/(e*x+d)^3-1/2*(a+b*ln(c*x^n))^2/e^2/(e*x+d)^2-1/3*b*n*(a+b*ln(c*x
^n))*ln(1+e*x/d)/d^2/e^2-1/3*b^2*n^2*polylog(2,-e*x/d)/d^2/e^2
```

Rubi [A] time = 0.62, antiderivative size = 229, normalized size of antiderivative = 1.09, number of steps used = 22, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44}

$$-\frac{b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^2e^2}-\frac{bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{3d^2e^2}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{6d^2e^2}-\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{3d^2e(d+ex)}-\frac{bn\left(a+b\,\mathrm{lo}\right.}{3e^2(d+}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] (b^2*n^2)/(3*d*e^2*(d + e*x)) + (b^2*n^2*Log[x])/(3*d^2*e^2) - (b*n*(a + b*
Log[c*x^n]))/(3*e^2*(d + e*x)^2) - (b*n*x*(a + b*Log[c*x^n]))/(3*d^2*e*(d +
 e*x)) + (a + b*Log[c*x^n])^2/(6*d^2*e^2) + (d*(a + b*Log[c*x^n])^2)/(3*e^2
*(d + e*x)^3) - (a + b*Log[c*x^n])^2/(2*e^2*(d + e*x)^2) - (b*n*(a + b*Log[
c*x^n])*Log[1 + (e*x)/d])/(3*d^2*e^2) - (b^2*n^2*PolyLog[2, -((e*x)/d)])/(3
*d^2*e^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
```

```
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^4}\,dx = \int\left(-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^4}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^3}\right)dx$$

$$= \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^3}\,dx}{e} - \frac{d\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^4}\,dx}{e}$$

$$= \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3e^2(d+ex)^3} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} + \frac{(bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{e^2} - \frac{(2bdn)\int \frac{a+b\log(cx^n}{x(d+ex)^3}}{3e^2}$$

$$= \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3e^2(d+ex)^3} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} - \frac{(2bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{3e^2} + \frac{(bn)\int \frac{a+b\log(cx^n)}{x(d+ex)}}{de^2}$$

$$= -\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^2} - \frac{bnx\left(a+b\log\left(cx^n\right)\right)}{d^2e(d+ex)} + \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3e^2(d+ex)^3} - \frac{\left(a+b\log(cx\right.}{2e^2(d+ex)}$$

$$= -\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^2} - \frac{bnx\left(a+b\log\left(cx^n\right)\right)}{3d^2e(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e^2} + \frac{d\left(a+b\log(cx\right.}{3e^2(d+ex)^3}$$

$$= \frac{b^2n^2}{3de^2(d+ex)} + \frac{b^2n^2\log(x)}{3d^2e^2} - \frac{bn\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^2} - \frac{bnx\left(a+b\log\left(cx^n\right)\right)}{3d^2e(d+ex)} + \frac{\left(a+b\,l\right.}{6}$$

$$= \frac{b^2n^2}{3de^2(d+ex)} + \frac{b^2n^2\log(x)}{3d^2e^2} - \frac{bn\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^2} - \frac{bnx\left(a+b\log\left(cx^n\right)\right)}{3d^2e(d+ex)} + \frac{\left(a+b\,l\right.}{6}$$

Mathematica [A] time = 0.25, size = 281, normalized size = 1.34

$$3a^2de^2x^2 + a^2e^3x^3 - 2b\log\left(cx^n\right)\left(bn(d+ex)^3\log\left(\frac{ex}{d}+1\right) - ex(aex(3d+ex)+bdn(d+ex))\right) - 2abd^3n\log\left(\frac{ex}{d}+\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] (2*b^2*d^3*n^2 + 2*a*b*d^2*e*n*x + 4*b^2*d^2*e*n^2*x + 3*a^2*d*e^2*x^2 + 2*
a*b*d*e^2*n*x^2 + 2*b^2*d*e^2*n^2*x^2 + a^2*e^3*x^3 + b^2*e^2*x^2*(3*d + e*
x)*Log[c*x^n]^2 - 2*a*b*d^3*n*Log[1 + (e*x)/d] - 6*a*b*d^2*e*n*x*Log[1 + (e
*x)/d] - 6*a*b*d*e^2*n*x^2*Log[1 + (e*x)/d] - 2*a*b*e^3*n*x^3*Log[1 + (e*x)
/d] - 2*b*Log[c*x^n]*(-(e*x*(b*d*n*(d + e*x) + a*e*x*(3*d + e*x))) + b*n*(d
 + e*x)^3*Log[1 + (e*x)/d]) - 2*b^2*n^2*(d + e*x)^3*PolyLog[2, -((e*x)/d)])
/(6*d^2*e^2*(d + e*x)^3)
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x\log\left(cx^n\right)^2 + 2\,abx\log\left(cx^n\right) + a^2x}{e^4x^4 + 4\,de^3x^3 + 6\,d^2e^2x^2 + 4\,d^3ex + d^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*x*log(c*x^n)^2 + 2*a*b*x*log(c*x^n) + a^2*x)/(e^4*x^4 + 4*d*e
^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2x}{(ex+d)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x/(e*x + d)^4, x)
```

maple [C] time = 0.30, size = 1400, normalized size = 6.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)^2/(e*x+d)^4,x)
```

```
[Out] 1/6*I/e^2*n/d^2*ln(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I/
e^2*n/d/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-1/2*I/e^2*ln(x^n)/(e*x+d)^2*b^2*Pi*c
sgn(I*c*x^n)^2*csgn(I*c)-1/3*I*ln(x^n)*d/e^2/(e*x+d)^3*b^2*Pi*csgn(I*c*x^n)
^3-1/6*I/e^2*n/(e*x+d)^2*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*b^2*ln(x^n)^2
/e^2/(e*x+d)^2+1/4*(-I*Pi*b*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+I*Pi*b*csgn
(I*c)*csgn(I*c*x^n)^2+I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*csgn(I*c*x^
n)^3+2*b*ln(c)+2*a)^2*(-1/2/e^2/(e*x+d)^2+1/3*d/e^2/(e*x+d)^3)+1/6*I/e^2*n/
d^2*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I*ln(x^n)*d/e^2/(e*x+d)^3*
b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/6*I/e^2*n/d/(e*x+d)*b^2*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)-1/3*I*ln(x^n)*d/e^2/(e*x+d)^3*b^2*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+1/6*I/e^2*n/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)-1/6*I/e^2*n/d^2*ln(x)*b^2*Pi*csgn(I*c*x^n)^3-1/3*b/e^2*n/(e*x+
d)^2*a-1/3/e^2*n/(e*x+d)^2*b^2*ln(c)-1/2*I/e^2*ln(x^n)/(e*x+d)^2*b^2*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2+1/6*I/e^2*n/d^2*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-1
/6*I/e^2*n/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/6*I/e^2*n/d/(e*x+
d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/3*I*ln(x^n)*d/e^2/(e*x+d)^3*b^2*Pi*cs
gn(I*c*x^n)^2*csgn(I*c)-1/6*I/e^2*n/d^2*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*cs
gn(I*c)+1/6*I/e^2*n/d/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I/e^2*
ln(x^n)/(e*x+d)^2*b^2*Pi*csgn(I*c*x^n)^3+1/6*I/e^2*n/(e*x+d)^2*b^2*Pi*csgn(
I*c*x^n)^3+1/3*b/e^2*n/d/(e*x+d)*a+1/3*b/e^2*n/d^2*ln(x)*a-1/3*b/e^2*n/d^2*
ln(e*x+d)*a+1/3*b^2/e^2*n^2/d^2*ln(e*x+d)*ln(-1/d*e*x)-1/6*b^2/e^2*n^2/d^2*
ln(x)^2+1/3*b^2/e^2*n^2/d^2*dilog(-1/d*e*x)+1/3/e^2*n/d/(e*x+d)*b^2*ln(c)+1
/3/e^2*n/d^2*ln(x)*b^2*ln(c)-1/3/e^2*n/d^2*ln(e*x+d)*b^2*ln(c)+1/2*I/e^2*ln
(x^n)/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/6*I/e^2*n/d^2*
ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/6*I/e^2*n/d^2*ln(e*x+d)*b^2*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2+2/3*b*ln(x^n)*d/e^2/(e*x+d)^3*a-1/6*I/e^2*n/d^2*ln
(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*b^2*n/e^2*ln(x^n)/(e*x+d
)^2+1/3*b^2*ln(x^n)^2*d/e^2/(e*x+d)^3-b/e^2*ln(x^n)/(e*x+d)^2*a-1/e^2*ln(x^
n)/(e*x+d)^2*b^2*ln(c)+2/3*ln(x^n)*d/e^2/(e*x+d)^3*b^2*ln(c)+1/3*b^2*n/e^2*
ln(x^n)/d^2*ln(x)-1/3*b^2*n/e^2*ln(x^n)/d^2*ln(e*x+d)+1/3*b^2*n/e^2*ln(x^n)
/d/(e*x+d)+1/3*b^2*n^2/d/e^2/(e*x+d)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\,abn\left(\frac{x}{de^3x^2+2\,d^2e^2x+d^3e}-\frac{\log\left(ex+d\right)}{d^2e^2}+\frac{\log(x)}{d^2e^2}\right)-\frac{1}{6}\left(\frac{(3\,ex+d)\log\left(x^n\right)^2}{e^5x^3+3\,de^4x^2+3\,d^2e^3x+d^3e^2}-6\int\frac{3\,e^2x^2\log(c}{3(}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/3*a*b*n*(x/(d*e^3*x^2 + 2*d^2*e^2*x + d^3*e) - log(e*x + d)/(d^2*e^2) + l
og(x)/(d^2*e^2)) - 1/6*((3*e*x + d)*log(x^n)^2/(e^5*x^3 + 3*d*e^4*x^2 + 3*d
^2*e^3*x + d^3*e^2) - 6*integrate(1/3*(3*e^2*x^2*log(c)^2 + (4*d*e*n*x + d^
2*n + 3*(e^2*n + 2*e^2*log(c))*x^2)*log(x^n))/(e^6*x^5 + 4*d*e^5*x^4 + 6*d^
2*e^4*x^3 + 4*d^3*e^3*x^2 + d^4*e^2*x), x))*b^2 - 1/3*(3*e*x + d)*a*b*log(c
*x^n)/(e^5*x^3 + 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2) - 1/6*(3*e*x + d)*a^2
/(e^5*x^3 + 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,(a+b\,\ln(c\,x^n))^2}{(d+e\,x)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n))^2)/(d + e*x)^4,x)
[Out] int((x*(a + b*log(c*x^n))^2)/(d + e*x)^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))**2/(e*x+d)**4,x)
[Out] Integral(x*(a + b*log(c*x**n))**2/(d + e*x)**4, x)
```

3.117 $\int \frac{(a+b\log(cx^n))^2}{(d+ex)^4}\,dx$

Optimal. Leaf size=203

$$-\frac{2bn\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{3d^3e}-\frac{2bnx\left(a+b\log\left(cx^n\right)\right)}{3d^3(d+ex)}+\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3de(d+ex)^2}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{3e(d+ex)^3}+\frac{2b^2n^2\mathrm{Li}}{3d}$$

```
[Out] -1/3*b^2*n^2/d^2/e/(e*x+d)-1/3*b^2*n^2*ln(x)/d^3/e+1/3*b*n*(a+b*ln(c*x^n))/
d/e/(e*x+d)^2-2/3*b*n*x*(a+b*ln(c*x^n))/d^3/(e*x+d)-2/3*b*n*ln(1+d/e/x)*(a+
b*ln(c*x^n))/d^3/e-1/3*(a+b*ln(c*x^n))^2/e/(e*x+d)^3+b^2*n^2*ln(e*x+d)/d^3/
e+2/3*b^2*n^2*polylog(2,-d/e/x)/d^3/e
```

Rubi [A] time = 0.31, antiderivative size = 221, normalized size of antiderivative = 1.09, number of steps used = 12, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.450, Rules used = {2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44}

$$-\frac{2b^2n^2\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^3e}-\frac{2bnx\left(a+b\log\left(cx^n\right)\right)}{3d^3(d+ex)}-\frac{2bn\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{3d^3e}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{3d^3e}+\frac{bn(}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(d + e*x)^4,x]
```

```
[Out] -(b^2*n^2)/(3*d^2*e*(d + e*x)) - (b^2*n^2*Log[x])/(3*d^3*e) + (b*n*(a + b*L
og[c*x^n]))/(3*d*e*(d + e*x)^2) - (2*b*n*x*(a + b*Log[c*x^n]))/(3*d^3*(d +
e*x)) + (a + b*Log[c*x^n])^2/(3*d^3*e) - (a + b*Log[c*x^n])^2/(3*e*(d + e*x
)^3) + (b^2*n^2*Log[d + e*x])/(d^3*e) - (2*b*n*(a + b*Log[c*x^n])*Log[1 + (
e*x)/d])/(3*d^3*e) - (2*b^2*n^2*PolyLog[2, -((e*x)/d)])/(3*d^3*e)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^4}\,dx &= -\frac{\left(a+b\log\left(cx^n\right)\right)^2}{3e(d+ex)^3}+\frac{(2bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^3}\,dx}{3e}\\
&= -\frac{\left(a+b\log\left(cx^n\right)\right)^2}{3e(d+ex)^3}-\frac{(2bn)\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{3d}+\frac{(2bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{3de}\\
&= \frac{bn\left(a+b\log\left(cx^n\right)\right)}{3de(d+ex)^2}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{3e(d+ex)^3}-\frac{(2bn)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{3d^2}+\frac{(2bn)\int \frac{a+b\log(cx^n)}{x(d+ex)}}{3d^2e}\\
&= \frac{bn\left(a+b\log\left(cx^n\right)\right)}{3de(d+ex)^2}-\frac{2bnx\left(a+b\log\left(cx^n\right)\right)}{3d^3(d+ex)}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{3e(d+ex)^3}-\frac{(2bn)\int \frac{a+b\log(cx^n)}{d+ex}}{3d^3}\\
&= -\frac{b^2n^2}{3d^2e(d+ex)}-\frac{b^2n^2\log(x)}{3d^3e}+\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3de(d+ex)^2}-\frac{2bnx\left(a+b\log\left(cx^n\right)\right)}{3d^3(d+ex)}+\frac{(a+b}{}\\
&= -\frac{b^2n^2}{3d^2e(d+ex)}-\frac{b^2n^2\log(x)}{3d^3e}+\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3de(d+ex)^2}-\frac{2bnx\left(a+b\log\left(cx^n\right)\right)}{3d^3(d+ex)}+\frac{(a+b}{}
\end{aligned}$$

Mathematica [A] time = 0.16, size = 211, normalized size = 1.04

$$\frac{2bn\left(-\frac{\log\left(\frac{d+ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2bd^3n}+\frac{a+b\log\left(cx^n\right)}{d^2(d+ex)}+\frac{a+b\log\left(cx^n\right)}{2d(d+ex)^2}-\frac{bn\text{Li}_2\left(-\frac{ex}{d}\right)}{d^3}-\frac{bn\left(-\frac{\log(d+ex)}{d^2}+\frac{\log(x)}{d^2}+\frac{1}{d(d+ex)}\right)}{2d}-\frac{bn\left(\log\right.}{}}{3e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(d + e*x)^4,x]
```

```
[Out] -1/3*(a + b*Log[c*x^n])^2/(e*(d + e*x)^3) + (2*b*n*((a + b*Log[c*x^n])/(2*d
*(d + e*x)^2) + (a + b*Log[c*x^n])/(d^2*(d + e*x)) + (a + b*Log[c*x^n])^2/(
2*b*d^3*n) - (b*n*(1/(d*(d + e*x)) + Log[x]/d^2 - Log[d + e*x]/d^2))/(2*d)
- (b*n*(Log[x]/d - Log[d + e*x]/d))/d^2 - ((a + b*Log[c*x^n])*Log[(d + e*x)
/d])/d^3 - (b*n*PolyLog[2, -((e*x)/d)])/d^3))/(3*e)
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\log\left(cx^n\right)^2 + 2\,ab\log\left(cx^n\right) + a^2}{e^4x^4 + 4\,de^3x^3 + 6\,d^2e^2x^2 + 4\,d^3ex + d^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^4*x^4 + 4*d*e^3*x^3
 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right) + a\right)^2}{\left(ex + d\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/(e*x + d)^4, x)
```

maple [C] time = 0.28, size = 1227, normalized size = 6.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/(e*x+d)^4,x)
```

```
[Out] 1/3*I/e*n/d^3*ln(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*I/e*
n/d^3*ln(x)*b^2*Pi*csgn(I*c*x^n)^3+1/3*I/e*n/d^3*ln(e*x+d)*b^2*Pi*csgn(I*c*
x^n)^3-1/3*I/e*n/d^2/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-1/6*I/e*n/d/(e*x+d)^2*b
^2*Pi*csgn(I*c*x^n)^3-1/3*b^2/(e*x+d)^3/e*ln(x^n)^2-1/12*(-I*Pi*b*csgn(I*c)
*csgn(I*x^n)*csgn(I*c*x^n)+I*Pi*b*csgn(I*c)*csgn(I*c*x^n)^2+I*Pi*b*csgn(I*x
^n)*csgn(I*c*x^n)^2-I*Pi*b*csgn(I*c*x^n)^3+2*b*ln(c)+2*a)^2/(e*x+d)^3/e+1/6
*I/e*n/d/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/6*I/e*n/d/(e*x+d)^2
*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/3*I/e*n/d^2/(e*x+d)*b^2*Pi*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)-1/3*I/e*n/d^3*ln(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2-1/3*I/(e*x+d)^3/e*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/3*I/
(e*x+d)^3/e*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/3*I/e*n/d^3*ln(e*x+d
)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/3*b/e*n/d/(e*x+d)^2*a+2/3*b/e*n/d^3*ln
(x)*a-2/3*b/e*n/d^3*ln(e*x+d)*a+2/3*b/e*n/d^2/(e*x+d)*a-2/3/e*n/d^3*ln(e*x+
d)*b^2*ln(c)+2/3/e*n/d^3*ln(x)*b^2*ln(c)+2/3/e*n/d^2/(e*x+d)*b^2*ln(c)+1/3/
e*n/d/(e*x+d)^2*b^2*ln(c)+1/3*I/e*n/d^3*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x
^n)^2+1/3*I/e*n/d^3*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+2/3*b^2/e*n*ln(x
^n)/d^2/(e*x+d)+1/3*b^2/e*n*ln(x^n)/d/(e*x+d)^2-2/3*b/(e*x+d)^3/e*ln(x^n)*a
-2/3/(e*x+d)^3/e*ln(x^n)*b^2*ln(c)+2/3*b^2/e*n^2/d^3*ln(e*x+d)*ln(-1/d*e*x)
+1/3*I/e*n/d^2/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/3*I/e*n/d^2/(e*x+
d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I/(e*x+d)^3/e*ln(x^n)*b^2*Pi*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*b^2/e*n^2/d^3*ln(x)^2+2/3*b^2/e*n^2/d^3
```

```
*dilog(-1/d*e*x)+1/3*I/(e*x+d)^3/e*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^3-1/3*I/e*n
/d^3*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I/e*n/d/(e*x+d)^2
*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2/3*b^2/e*n*ln(x^n)/d^3*ln(x)-2
/3*b^2/e*n/d^3*ln(x^n)*ln(e*x+d)-1/3*b^2*n^2/d^2/e/(e*x+d)-b^2*n^2*ln(x)/d^
3/e+b^2*n^2*ln(e*x+d)/d^3/e
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\,abn\left(\frac{2\,ex+3\,d}{d^2e^3x^2+2\,d^3e^2x+d^4e}-\frac{2\,\log\left(ex+d\right)}{d^3e}+\frac{2\,\log(x)}{d^3e}\right)-\frac{1}{3}\,b^2\left(\frac{\log\left(x^n\right)^2}{e^4x^3+3\,de^3x^2+3\,d^2e^2x+d^3e}-3\int\frac{3\,ex\log}{3\left(e^5x^5\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/3*a*b*n*((2*e*x + 3*d)/(d^2*e^3*x^2 + 2*d^3*e^2*x + d^4*e) - 2*log(e*x +
d)/(d^3*e) + 2*log(x)/(d^3*e)) - 1/3*b^2*(log(x^n)^2/(e^4*x^3 + 3*d*e^3*x^2
 + 3*d^2*e^2*x + d^3*e) - 3*integrate(1/3*(3*e*x*log(c)^2 + 2*(d*n + (e*n +
 3*e*log(c))*x)*log(x^n))/(e^5*x^5 + 4*d*e^4*x^4 + 6*d^2*e^3*x^3 + 4*d^3*e^
2*x^2 + d^4*e*x), x)) - 2/3*a*b*log(c*x^n)/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e
^2*x + d^3*e) - 1/3*a^2/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e^2*x + d^3*e)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\left(a+b\,\ln\left(c\,x^n\right)\right)^2}{\left(d+e\,x\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(d + e*x)^4,x)
```

```
[Out] int((a + b*log(c*x^n))^2/(d + e*x)^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/(e*x+d)**4,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(d + e*x)**4, x)
```

3.118 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^4}\,dx$

Optimal. Leaf size=351

$$-\frac{2bn\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{d^4}-\frac{ex\left(a+b\log\left(cx^n\right)\right)^2}{d^4(d+ex)}+\frac{11bn\log\left(\frac{ex}{d}+1\right)\left(a+\right.}{3d^4}$$

```
[Out] 1/3*b^2*n^2/d^3/(e*x+d)+1/3*b^2*n^2*ln(x)/d^4-1/3*b*n*(a+b*ln(c*x^n))/d^2/(
e*x+d)^2+5/3*b*e*n*x*(a+b*ln(c*x^n))/d^4/(e*x+d)-5/6*(a+b*ln(c*x^n))^2/d^4+
1/3*(a+b*ln(c*x^n))^2/d/(e*x+d)^3+1/2*(a+b*ln(c*x^n))^2/d^2/(e*x+d)^2-e*x*(
a+b*ln(c*x^n))^2/d^4/(e*x+d)+1/3*(a+b*ln(c*x^n))^3/b/d^4/n-2*b^2*n^2*ln(e*x
+d)/d^4+11/3*b*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/d^4-(a+b*ln(c*x^n))^2*ln(1+e*x
/d)/d^4+11/3*b^2*n^2*polylog(2,-e*x/d)/d^4-2*b*n*(a+b*ln(c*x^n))*polylog(2,
-e*x/d)/d^4+2*b^2*n^2*polylog(3,-e*x/d)/d^4
```

Rubi [A] time = 1.01, antiderivative size = 351, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 14, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.609, Rules used = {2347, 2344, 2302, 30, 2317, 2374, 6589, 2318, 2391, 2319, 2301, 2314, 31, 44}

$$-\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}+\frac{11b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^4}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^4}-\frac{\log\left(\frac{ex}{d}+1\right)\left(a+\right.}{d^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x)^4),x]
```

```
[Out] (b^2*n^2)/(3*d^3*(d + e*x)) + (b^2*n^2*Log[x])/(3*d^4) - (b*n*(a + b*Log[c*
x^n]))/(3*d^2*(d + e*x)^2) + (5*b*e*n*x*(a + b*Log[c*x^n]))/(3*d^4*(d + e*x
)) - (5*(a + b*Log[c*x^n])^2)/(6*d^4) + (a + b*Log[c*x^n])^2/(3*d*(d + e*x)
^3) + (a + b*Log[c*x^n])^2/(2*d^2*(d + e*x)^2) - (e*x*(a + b*Log[c*x^n])^2)
/(d^4*(d + e*x)) + (a + b*Log[c*x^n])^3/(3*b*d^4*n) - (2*b^2*n^2*Log[d + e*
x])/d^4 + (11*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(3*d^4) - ((a + b*Lo
g[c*x^n])^2*Log[1 + (e*x)/d])/d^4 + (11*b^2*n^2*PolyLog[2, -((e*x)/d)])/(3*
d^4) - (2*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^4 + (2*b^2*n^2*P
olyLog[3, -((e*x)/d)])/d^4
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x(d+ex)^4}\,dx = \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{x(d+ex)^3}\,dx}{d} - \frac{e\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^4}\,dx}{d}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^2}{3d(d+ex)^3} + \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{x(d+ex)^2}\,dx}{d^2} - \frac{e\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^3}\,dx}{d^2} - \frac{(2bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^3}\,d}{3d}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^2}{3d(d+ex)^3} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^2(d+ex)^2} + \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{x(d+ex)}\,dx}{d^3} - \frac{e\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^2}\,dx}{d^3} -$$

$$= -\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3d^2(d+ex)^2} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{3d(d+ex)^3} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^2(d+ex)^2} - \frac{ex\left(a+b\log\left(cx^n\right.\right.}{d^4(d+ex)}$$

$$= -\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3d^2(d+ex)^2} + \frac{5benx\left(a+b\log\left(cx^n\right)\right)}{3d^4(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{3d(d+ex)^3} + \frac{\left(a+b\log\left(\right.\right.}{2d^2(d+e}$$

$$= \frac{b^2n^2}{3d^3(d+ex)} + \frac{b^2n^2\log(x)}{3d^4} - \frac{bn\left(a+b\log\left(cx^n\right)\right)}{3d^2(d+ex)^2} + \frac{5benx\left(a+b\log\left(cx^n\right)\right)}{3d^4(d+ex)} - \frac{5\left(a\right.}{}$$

$$= \frac{b^2n^2}{3d^3(d+ex)} + \frac{b^2n^2\log(x)}{3d^4} - \frac{bn\left(a+b\log\left(cx^n\right)\right)}{3d^2(d+ex)^2} + \frac{5benx\left(a+b\log\left(cx^n\right)\right)}{3d^4(d+ex)} - \frac{5\left(a\right.}{}$$

Mathematica [A] time = 0.43, size = 318, normalized size = 0.91

$$\frac{\frac{2d^3\left(a+b\log(cx^n)\right)^2}{(d+ex)^3} + \frac{3d^2\left(a+b\log(cx^n)\right)^2}{(d+ex)^2} - \frac{2bd^2n\left(a+b\log(cx^n)\right)}{(d+ex)^2} - 12bn\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right) + \frac{6d\left(a+b\log(cx^n)\right)^2}{d+ex} - \frac{10bdn}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x)^4),x]
```

```
[Out] ((-2*b*d^2*n*(a + b*Log[c*x^n]))/(d + e*x)^2 - (10*b*d*n*(a + b*Log[c*x^n])
)/(d + e*x) - 11*(a + b*Log[c*x^n])^2 + (2*d^3*(a + b*Log[c*x^n])^2)/(d + e
*x)^3 + (3*d^2*(a + b*Log[c*x^n])^2)/(d + e*x)^2 + (6*d*(a + b*Log[c*x^n])^
2)/(d + e*x) + (2*(a + b*Log[c*x^n])^3)/(b*n) + 10*b^2*n^2*(Log[x] - Log[d
+ e*x]) + (2*b^2*n^2*(d + (d + e*x)*Log[x] - (d + e*x)*Log[d + e*x]))/(d +
e*x) + 22*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 6*(a + b*Log[c*x^n])^2*
Log[1 + (e*x)/d] + 22*b^2*n^2*PolyLog[2, -((e*x)/d)] - 12*b*n*(a + b*Log[c*
x^n])*PolyLog[2, -((e*x)/d)] + 12*b^2*n^2*PolyLog[3, -((e*x)/d)])/(6*d^4)
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2\log\left(cx^n\right)^2 + 2\,ab\log\left(cx^n\right) + a^2}{e^4x^5 + 4\,de^3x^4 + 6\,d^2e^2x^3 + 4\,d^3ex^2 + d^4x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^4*x^5 + 4*d*e^3*x^4
 + 6*d^2*e^2*x^3 + 4*d^3*e*x^2 + d^4*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2}{(ex+d)^4x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^4*x), x)
```

maple [F] time = 0.92, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n)+a)^2}{(ex+d)^4\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x/(e*x+d)^4,x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/x/(e*x+d)^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{6}a^2\left(\frac{6\,e^2x^2+15\,dex+11\,d^2}{d^3e^3x^3+3\,d^4e^2x^2+3\,d^5ex+d^6}-\frac{6\,\log(ex+d)}{d^4}+\frac{6\,\log(x)}{d^4}\right)+\int\frac{b^2\log(c)^2+b^2\log\left(x^n\right)^2+2\,ab\log(c)+2}{e^4x^5+4\,de^3x^4+6\,d^2e^2x^3+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/6*a^2*((6*e^2*x^2 + 15*d*e*x + 11*d^2)/(d^3*e^3*x^3 + 3*d^4*e^2*x^2 + 3*d
^5*e*x + d^6) - 6*log(e*x + d)/d^4 + 6*log(x)/d^4) + integrate((b^2*log(c)^
2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e^4*x^5
 + 4*d*e^3*x^4 + 6*d^2*e^2*x^3 + 4*d^3*e*x^2 + d^4*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\ln(c\,x^n))^2}{x\,(d+e\,x)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x*(d + e*x)^4),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(x*(d + e*x)^4), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x\,(d+ex)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(e*x+d)**4,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x*(d + e*x)**4), x)
```

3.119 $\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)^4}\,dx$

Optimal. Leaf size=420

$$\frac{3e^2x\left(a+b\log\left(cx^n\right)\right)^2}{d^5(d+ex)}-\frac{8be^2nx\left(a+b\log\left(cx^n\right)\right)}{3d^5(d+ex)}+\frac{8ben\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^5}-\frac{4e\left(a+b\log\left(cx^n\right)\right)^3}{3bd^5n}+\frac{4e(\ldots}{\ldots}$$

```
[Out] -2*b^2*n^2/d^4/x-1/3*b^2*e*n^2/d^4/(e*x+d)-1/3*b^2*e*n^2*ln(x)/d^5-2*b*n*(a
+b*ln(c*x^n))/d^4/x+1/3*b*e*n*(a+b*ln(c*x^n))/d^3/(e*x+d)^2-8/3*b*e^2*n*x*(
a+b*ln(c*x^n))/d^5/(e*x+d)+4/3*e*(a+b*ln(c*x^n))^2/d^5-(a+b*ln(c*x^n))^2/d^
4/x-1/3*e*(a+b*ln(c*x^n))^2/d^2/(e*x+d)^3-e*(a+b*ln(c*x^n))^2/d^3/(e*x+d)^2
+3*e^2*x*(a+b*ln(c*x^n))^2/d^5/(e*x+d)-4/3*e*(a+b*ln(c*x^n))^3/b/d^5/n+3*b^
2*e*n^2*ln(e*x+d)/d^5-26/3*b*e*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/d^5+4*e*(a+b*l
n(c*x^n))^2*ln(1+e*x/d)/d^5-26/3*b^2*e*n^2*polylog(2,-e*x/d)/d^5+8*b*e*n*(a
+b*ln(c*x^n))*polylog(2,-e*x/d)/d^5-8*b^2*e*n^2*polylog(3,-e*x/d)/d^5
```

Rubi [A] time = 0.89, antiderivative size = 420, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 17, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.739, Rules used = {2353, 2305, 2304, 2302, 30, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44, 2318, 2374, 6589}

$$\frac{8ben\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^5}-\frac{26b^2en^2\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^5}-\frac{8b^2en^2\mathrm{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^5}+\frac{3e^2x\left(a+b\log\ldots\right.}{d^5(d+e\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^4),x]
```

```
[Out] (-2*b^2*n^2)/(d^4*x) - (b^2*e*n^2)/(3*d^4*(d + e*x)) - (b^2*e*n^2*Log[x])/(
3*d^5) - (2*b*n*(a + b*Log[c*x^n]))/(d^4*x) + (b*e*n*(a + b*Log[c*x^n]))/(3
*d^3*(d + e*x)^2) - (8*b*e^2*n*x*(a + b*Log[c*x^n]))/(3*d^5*(d + e*x)) + (4
*e*(a + b*Log[c*x^n])^2)/(3*d^5) - (a + b*Log[c*x^n])^2/(d^4*x) - (e*(a + b
*Log[c*x^n])^2)/(3*d^2*(d + e*x)^3) - (e*(a + b*Log[c*x^n])^2)/(d^3*(d + e*
x)^2) + (3*e^2*x*(a + b*Log[c*x^n])^2)/(d^5*(d + e*x)) - (4*e*(a + b*Log[c*
x^n])^3)/(3*b*d^5*n) + (3*b^2*e*n^2*Log[d + e*x])/d^5 - (26*b*e*n*(a + b*Lo
g[c*x^n])*Log[1 + (e*x)/d])/(3*d^5) + (4*e*(a + b*Log[c*x^n])^2*Log[1 + (e*
x)/d])/d^5 - (26*b^2*e*n^2*PolyLog[2, -((e*x)/d)])/(3*d^5) + (8*b*e*n*(a +
b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^5 - (8*b^2*e*n^2*PolyLog[3, -((e*x)
/d)])/d^5
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2(d+ex)^4}\,dx = \int \left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^4x^2} - \frac{4e\left(a+b\log\left(cx^n\right)\right)^2}{d^5x} + \frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{d^2(d+ex)^4} + \frac{2e^2\left(a+b\log\left(\right.\right.}{d^3(d+ex}\right.$$

$$= \frac{\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2}dx}{d^4} - \frac{(4e)\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}dx}{d^5} + \frac{\left(4e^2\right)\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}dx}{d^5} + \frac{\left(3e^2\right)\int \frac{(a+b\log}{(d+}}{d^4}$$

$$= -\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^4x} - \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{3d^2(d+ex)^3} - \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{d^3(d+ex)^2} + \frac{3e^2x\left(a+b\log\left(cx^n\right.\right.}{d^5(d+ex)}$$

$$= -\frac{2b^2n^2}{d^4x} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)}{d^4x} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^4x} - \frac{e\left(a+b\log\left(cx^n\right)\right)^2}{3d^2(d+ex)^3} - \frac{e\left(a+b\,l\right.}{d^3(d}$$

$$= -\frac{2b^2n^2}{d^4x} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)}{d^4x} + \frac{ben\left(a+b\log\left(cx^n\right)\right)}{3d^3(d+ex)^2} - \frac{2be^2nx\left(a+b\log\left(cx^n\right)\right)}{d^5(d+ex)} - \left(\right.$$

$$= -\frac{2b^2n^2}{d^4x} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)}{d^4x} + \frac{ben\left(a+b\log\left(cx^n\right)\right)}{3d^3(d+ex)^2} - \frac{8be^2nx\left(a+b\log\left(cx^n\right)\right)}{3d^5(d+ex)} + \frac{e}{}$$

$$= -\frac{2b^2n^2}{d^4x} - \frac{b^2en^2}{3d^4(d+ex)} - \frac{b^2en^2\log(x)}{3d^5} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)}{d^4x} + \frac{ben\left(a+b\log\left(cx^n\right)\right)}{3d^3(d+ex)^2}$$

$$= -\frac{2b^2n^2}{d^4x} - \frac{b^2en^2}{3d^4(d+ex)} - \frac{b^2en^2\log(x)}{3d^5} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)}{d^4x} + \frac{ben\left(a+b\log\left(cx^n\right)\right)}{3d^3(d+ex)^2}$$

Mathematica [**A**] time = 0.67, size = 378, normalized size = 0.90

$$-\frac{\frac{d^3e\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^3} + \frac{3d^2e\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^2} - \frac{bd^2en\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2} - 24ben\,\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right) + \frac{9de\left(a+b\log\left(cx^n\right)\right)^2}{d+ex} - \frac{8bden}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^4),x]
```

```
[Out] -1/3*((6*b^2*d*n^2)/x + (6*b*d*n*(a + b*Log[c*x^n]))/x - (b*d^2*e*n*(a + b*
Log[c*x^n]))/(d + e*x)^2 - (8*b*d*e*n*(a + b*Log[c*x^n]))/(d + e*x) - 13*e*
(a + b*Log[c*x^n])^2 + (3*d*(a + b*Log[c*x^n])^2)/x + (d^3*e*(a + b*Log[c*x
^n])^2)/(d + e*x)^3 + (3*d^2*e*(a + b*Log[c*x^n])^2)/(d + e*x)^2 + (9*d*e*(
a + b*Log[c*x^n])^2)/(d + e*x) + (4*e*(a + b*Log[c*x^n])^3)/(b*n) + 8*b^2*e
*n^2*(Log[x] - Log[d + e*x]) + (b^2*e*n^2*(d + (d + e*x)*Log[x] - (d + e*x)
*Log[d + e*x]))/(d + e*x) + 26*b*e*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] -
12*e*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 26*b^2*e*n^2*PolyLog[2, -((e*x
)/d)] - 24*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 24*b^2*e*n^2*P
olyLog[3, -((e*x)/d)])/d^5
```

fricas [**F**] time = 0.47, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2\log\left(cx^n\right)^2 + 2\,ab\log\left(cx^n\right) + a^2}{e^4x^6 + 4\,de^3x^5 + 6\,d^2e^2x^4 + 4\,d^3ex^3 + d^4x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^4*x^6 + 4*d*e^3*x^5
 + 6*d^2*e^2*x^4 + 4*d^3*e*x^3 + d^4*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log \left(cx^n\right) + a\right)^2}{(ex+d)^4 x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^4,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^4*x^2), x)
```

maple [F] time = 0.86, size = 0, normalized size = 0.00

$$\int \frac{(b \ln (c\, x^n) + a)^2}{(ex+d)^4\, x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x^2/(e*x+d)^4,x)
[Out] int((b*ln(c*x^n)+a)^2/x^2/(e*x+d)^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}\, a^2 \left(\frac{12\, e^3 x^3 + 30\, de^2 x^2 + 22\, d^2 ex + 3\, d^3}{d^4 e^3 x^4 + 3\, d^5 e^2 x^3 + 3\, d^6 ex^2 + d^7 x} - \frac{12\, e \log (ex+d)}{d^5} + \frac{12\, e \log(x)}{d^5}\right) + \int \frac{b^2 \log(c)^2 + b^2 \log \left(x^n\right)^2 + 2}{e^4 x^6 + 4\, de^3 x^5 +}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^4,x, algorithm="maxima")
[Out] -1/3*a^2*((12*e^3*x^3 + 30*d*e^2*x^2 + 22*d^2*e*x + 3*d^3)/(d^4*e^3*x^4 + 3
*d^5*e^2*x^3 + 3*d^6*e*x^2 + d^7*x) - 12*e*log(e*x + d)/d^5 + 12*e*log(x)/d
^5) + integrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(
c) + a*b)*log(x^n))/(e^4*x^6 + 4*d*e^3*x^5 + 6*d^2*e^2*x^4 + 4*d^3*e*x^3 +
d^4*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\, \ln (c\, x^n))^2}{x^2\, (d + e\, x)^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x^2*(d + e*x)^4),x)
[Out] int((a + b*log(c*x^n))^2/(x^2*(d + e*x)^4), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \log \left(cx^n\right)\right)^2}{x^2\, (d+ex)^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**2/(e*x+d)**4,x)
[Out] Integral((a + b*log(c*x**n))**2/(x**2*(d + e*x)**4), x)
```

3.120 $\int \frac{x\log^2(x)}{(d+ex)^4}\,dx$

Optimal. Leaf size=107

$$-\frac{\text{Li}_2\left(-\frac{ex}{d}\right)}{3d^2e^2}-\frac{\log(x)\log\left(\frac{ex}{d}+1\right)}{3d^2e^2}+\frac{x^2\log^2(x)(3d+ex)}{6d^2(d+ex)^3}-\frac{x}{3d^2e(d+ex)}+\frac{x\log(x)}{3de(d+ex)^2}$$

```
[Out] -1/3*x/d^2/e/(e*x+d)+1/3*x*ln(x)/d/e/(e*x+d)^2+1/6*x^2*(e*x+3*d)*ln(x)^2/d^
2/(e*x+d)^3-1/3*ln(x)*ln(1+e*x/d)/d^2/e^2-1/3*polylog(2,-e*x/d)/d^2/e^2
```

Rubi [A] time = 0.41, antiderivative size = 157, normalized size of antiderivative = 1.47, number of steps used = 22, number of rules used = 10, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.769, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44}

$$-\frac{\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^2e^2}+\frac{\log^2(x)}{6d^2e^2}-\frac{\log(x)\log\left(\frac{ex}{d}+1\right)}{3d^2e^2}+\frac{\log(x)}{3d^2e^2}-\frac{x\log(x)}{3d^2e(d+ex)}+\frac{1}{3de^2(d+ex)}-\frac{\log^2(x)}{2e^2(d+ex)^2}+\frac{d\log^2(x}{3e^2(d+e}$$

Antiderivative was successfully verified.

```
[In] Int[(x*Log[x]^2)/(d + e*x)^4,x]
```

```
[Out] 1/(3*d*e^2*(d + e*x)) + Log[x]/(3*d^2*e^2) - Log[x]/(3*e^2*(d + e*x)^2) - (
x*Log[x])/(3*d^2*e*(d + e*x)) + Log[x]^2/(6*d^2*e^2) + (d*Log[x]^2)/(3*e^2*
(d + e*x)^3) - Log[x]^2/(2*e^2*(d + e*x)^2) - (Log[x]*Log[1 + (e*x)/d])/(3*
d^2*e^2) - PolyLog[2, -((e*x)/d)]/(3*d^2*e^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x\log^2(x)}{(d+ex)^4}\,dx = \int \left(-\frac{d\log^2(x)}{e(d+ex)^4} + \frac{\log^2(x)}{e(d+ex)^3}\right) dx$$
$$= \frac{\int \frac{\log^2(x)}{(d+ex)^3}\,dx}{e} - \frac{d\int \frac{\log^2(x)}{(d+ex)^4}\,dx}{e}$$
$$= \frac{d\log^2(x)}{3e^2(d+ex)^3} - \frac{\log^2(x)}{2e^2(d+ex)^2} + \frac{\int \frac{\log(x)}{x(d+ex)^2}\,dx}{e^2} - \frac{(2d)\int \frac{\log(x)}{x(d+ex)^3}\,dx}{3e^2}$$
$$= \frac{d\log^2(x)}{3e^2(d+ex)^3} - \frac{\log^2(x)}{2e^2(d+ex)^2} - \frac{2\int \frac{\log(x)}{x(d+ex)^2}\,dx}{3e^2} + \frac{\int \frac{\log(x)}{x(d+ex)}\,dx}{de^2} + \frac{2\int \frac{\log(x)}{(d+ex)^3}\,dx}{3e} - \frac{\int \frac{\log(x)}{(d+ex)^2}\,dx}{de}$$
$$= -\frac{\log(x)}{3e^2(d+ex)^2} - \frac{x\log(x)}{d^2e(d+ex)} + \frac{d\log^2(x)}{3e^2(d+ex)^3} - \frac{\log^2(x)}{2e^2(d+ex)^2} + \frac{\int \frac{1}{x(d+ex)^2}\,dx}{3e^2} + \frac{\int \frac{\log(x)}{x}\,dx}{d^2e^2} - \frac{2\int$$
$$= -\frac{\log(x)}{3e^2(d+ex)^2} - \frac{x\log(x)}{3d^2e(d+ex)} + \frac{\log^2(x)}{2d^2e^2} + \frac{d\log^2(x)}{3e^2(d+ex)^3} - \frac{\log^2(x)}{2e^2(d+ex)^2} + \frac{\log(d+ex)}{d^2e^2} - \frac{\log(x}{}$$
$$= \frac{1}{3de^2(d+ex)} + \frac{\log(x)}{3d^2e^2} - \frac{\log(x)}{3e^2(d+ex)^2} - \frac{x\log(x)}{3d^2e(d+ex)} + \frac{\log^2(x)}{6d^2e^2} + \frac{d\log^2(x)}{3e^2(d+ex)^3} - \frac{\log^2(x)}{2e^2(d+ex)^2}$$
$$= \frac{1}{3de^2(d+ex)} + \frac{\log(x)}{3d^2e^2} - \frac{\log(x)}{3e^2(d+ex)^2} - \frac{x\log(x)}{3d^2e(d+ex)} + \frac{\log^2(x)}{6d^2e^2} + \frac{d\log^2(x)}{3e^2(d+ex)^3} - \frac{\log^2(x)}{2e^2(d+ex)^2}$$

Mathematica [A] time = 0.14, size = 96, normalized size = 0.90

$$\frac{e^2x^2\log^2(x)(3d+ex) - 2(d+ex)^3\text{Li}_2\left(-\frac{ex}{d}\right) + 2d(d+ex)^2 - 2\log(x)(d+ex)\left((d+ex)^2\log\left(\frac{ex}{d}+1\right) - dex\right)}{6d^2e^2(d+ex)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*Log[x]^2)/(d + e*x)^4,x]
```

```
[Out] (2*d*(d + e*x)^2 + e^2*x^2*(3*d + e*x)*Log[x]^2 - 2*(d + e*x)*Log[x]*(-(d*e
*x) + (d + e*x)^2*Log[1 + (e*x)/d]) - 2*(d + e*x)^3*PolyLog[2, -((e*x)/d)])
/(6*d^2*e^2*(d + e*x)^3)
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x\log(x)^2}{e^4x^4 + 4\,de^3x^3 + 6\,d^2e^2x^2 + 4\,d^3ex + d^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral(x*log(x)^2/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^
4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\log(x)^2}{(ex+d)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate(x*log(x)^2/(e*x + d)^4, x)
```

maple [F] time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{x \ln(x)^2}{(ex+d)^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*ln(x)^2/(e*x+d)^4,x)
```

```
[Out] int(x*ln(x)^2/(e*x+d)^4,x)
```

maxima [A] time = 0.71, size = 132, normalized size = 1.23

$$-\frac{d^2\log(x)^2 - 2\left(e^2\log(x) + e^2\right)x^2 - 2\,d^2 + \left(3\,de\log(x)^2 - 2\,de\log(x) - 4\,de\right)x}{6\left(de^5x^3 + 3\,d^2e^4x^2 + 3\,d^3e^3x + d^4e^2\right)} + \frac{\log(x)^2}{6\,d^2e^2} - \frac{\log\left(\frac{ex}{d} + 1\right)\log(x) +}{3\,d^2e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] -1/6*(d^2*log(x)^2 - 2*(e^2*log(x) + e^2)*x^2 - 2*d^2 + (3*d*e*log(x)^2 - 2
*d*e*log(x) - 4*d*e)*x)/(d*e^5*x^3 + 3*d^2*e^4*x^2 + 3*d^3*e^3*x + d^4*e^2)
 + 1/6*log(x)^2/(d^2*e^2) - 1/3*(log(e*x/d + 1)*log(x) + dilog(-e*x/d))/(d^
2*e^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x \ln(x)^2}{(d+e\,x)^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*log(x)^2)/(d + e*x)^4,x)
```

```
[Out] int((x*log(x)^2)/(d + e*x)^4, x)
```

sympy [A] time = 55.50, size = 357, normalized size = 3.34

$$\frac{(-d-3ex)\log(x)^2}{6d^3e^2 + 18d^2e^3x + 18de^4x^2 + 6e^5x^3} + \frac{\left(\begin{cases} \frac{x}{d^3} & \text{for } e = 0 \\ -\frac{1}{2e(d+ex)^2} & \text{otherwise} \end{cases}\right)\log(x)}{e} - \frac{\begin{cases} \frac{x}{d^3} & \text{for} \\ -\frac{1}{2d^2e+2de^2x} - \frac{\log(x)}{2d^2e} + \frac{\log\left(\frac{d}{e}+x\right)}{2d^2e} & \text{otl} \end{cases}}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*ln(x)**2/(e*x+d)**4,x)
```

```
[Out] (-d - 3*e*x)*log(x)**2/(6*d**3*e**2 + 18*d**2*e**3*x + 18*d*e**4*x**2 + 6*e
**5*x**3) + Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*lo
g(x)/e - Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)
/(2*d**2*e) + log(d/e + x)/(2*d**2*e), True))/e + Piecewise((-1/(e**3*x), E
q(d, 0)), (-1/(2*d*e**2 + 2*e**3*x) - log(d + e*x)/(2*d*e**2), True))/(3*d)
```

```
 - Piecewise((1/(e**3*x), Eq(d, 0)), (-1/(2*d*(d/x + e)**2), True))*log(x)/
(3*d) - 2*Piecewise((-1/(e**2*x), Eq(d, 0)), (-log(d**2 + d*e*x)/(d*e), Tru
e))/(3*d*e) + 2*Piecewise((1/(e**2*x), Eq(d, 0)), (-1/(d**2/x + d*e), True)
)*log(x)/(3*d*e) + Piecewise((-1/(e*x), Eq(d, 0)), (Piecewise((log(e)*log(x
) + polylog(2, d*exp_polar(I*pi)/(e*x)), Abs(x) < 1), (-log(e)*log(1/x) + p
olylog(2, d*exp_polar(I*pi)/(e*x)), 1/Abs(x) < 1), (-meijerg(((), (1, 1)),
((0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) + p
olylog(2, d*exp_polar(I*pi)/(e*x)), True))/d, True))/(3*d*e**2) - Piecewise
((1/(e*x), Eq(d, 0)), (log(d/x + e)/d, True))*log(x)/(3*d*e**2)
```

3.121 $\int \frac{(a+b\log(cx^n))^3}{x(d+ex)}\,dx$

Optimal. Leaf size=113

$$\frac{6b^2n^2\text{Li}_3\left(-\frac{d}{ex}\right)\left(a+b\log\left(cx^n\right)\right)}{d}+\frac{3bn\text{Li}_2\left(-\frac{d}{ex}\right)\left(a+b\log\left(cx^n\right)\right)^2}{d}-\frac{\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)^3}{d}+\frac{6b^3n^3\text{Li}_4\left(\right.}{d}$$

```
[Out] -ln(1+d/e/x)*(a+b*ln(c*x^n))^3/d+3*b*n*(a+b*ln(c*x^n))^2*polylog(2,-d/e/x)/
d+6*b^2*n^2*(a+b*ln(c*x^n))*polylog(3,-d/e/x)/d+6*b^3*n^3*polylog(4,-d/e/x)
/d
```

Rubi [A] time = 0.21, antiderivative size = 130, normalized size of antiderivative = 1.15, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2344, 2302, 30, 2317, 2374, 2383, 6589}

$$\frac{6b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d}-\frac{3bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)^2}{d}-\frac{6b^3n^3\text{PolyLog}\left(4,-\frac{ex}{d}\right)}{d}-\text{lo}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^3/(x*(d + e*x)),x]
```

```
[Out] (a + b*Log[c*x^n])^4/(4*b*d*n) - ((a + b*Log[c*x^n])^3*Log[1 + (e*x)/d])/d
- (3*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((e*x)/d)])/d + (6*b^2*n^2*(a + b
*Log[c*x^n])*PolyLog[3, -((e*x)/d)])/d - (6*b^3*n^3*PolyLog[4, -((e*x)/d)])
/d
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
```

```
&& EqQ[d*e, 1]
```

Rule 2383

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^p)/q
, x] - Dist[(b*n*p)/q, Int[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^(p - 1
))/x, x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^3}{x(d+ex)}\,dx = \frac{\int \frac{\left(a+b\log\left(cx^n\right)\right)^3}{x}\,dx}{d} - \frac{e\int \frac{\left(a+b\log\left(cx^n\right)\right)^3}{d+ex}\,dx}{d}$$

$$= -\frac{\left(a+b\log\left(cx^n\right)\right)^3\log\left(1+\frac{ex}{d}\right)}{d} + \frac{\text{Subst}\left(\int x^3\,dx, x, a+b\log\left(cx^n\right)\right)}{bdn} + \frac{(3bn)\int \frac{(a+b\log}{}}{}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^4}{4bdn} - \frac{\left(a+b\log\left(cx^n\right)\right)^3\log\left(1+\frac{ex}{d}\right)}{d} - \frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\text{Li}_2\left(-\frac{ex}{d}\right)}{d}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^4}{4bdn} - \frac{\left(a+b\log\left(cx^n\right)\right)^3\log\left(1+\frac{ex}{d}\right)}{d} - \frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\text{Li}_2\left(-\frac{ex}{d}\right)}{d}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^4}{4bdn} - \frac{\left(a+b\log\left(cx^n\right)\right)^3\log\left(1+\frac{ex}{d}\right)}{d} - \frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\text{Li}_2\left(-\frac{ex}{d}\right)}{d}$$

Mathematica [B] time = 0.20, size = 243, normalized size = 2.15

$$\frac{-4b^2n^2\left(6\text{Li}_3\left(-\frac{ex}{d}\right) - 6\log(x)\text{Li}_2\left(-\frac{ex}{d}\right) + \log^2(x)\left(\log(x) - 3\log\left(\frac{ex}{d}+1\right)\right)\right)\left(-a-b\log\left(cx^n\right)+bn\log(x)\right) + 6bn}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^3/(x*(d + e*x)),x]
```

```
[Out] (4*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n])^3 - 4*(a - b*n*Log[x] + b*Log[c*x
^n])^3*Log[d + e*x] + 6*b*n*(a - b*n*Log[x] + b*Log[c*x^n])^2*(Log[x]^2 - 2
*(Log[x]*Log[1 + (e*x)/d] + PolyLog[2, -((e*x)/d)])) - 4*b^2*n^2*(-a + b*n*
Log[x] - b*Log[c*x^n])*(Log[x]^2*(Log[x] - 3*Log[1 + (e*x)/d]) - 6*Log[x]*P
olyLog[2, -((e*x)/d)] + 6*PolyLog[3, -((e*x)/d)]) + b^3*n^3*(Log[x]^4 - 4*L
og[x]^3*Log[1 + (e*x)/d] - 12*Log[x]^2*PolyLog[2, -((e*x)/d)] + 24*Log[x]*P
olyLog[3, -((e*x)/d)] - 24*PolyLog[4, -((e*x)/d)]))/(4*d)
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^3\log\left(cx^n\right)^3 + 3\,ab^2\log\left(cx^n\right)^2 + 3\,a^2b\log\left(cx^n\right) + a^3}{ex^2+dx}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^3*log(c*x^n)^3 + 3*a*b^2*log(c*x^n)^2 + 3*a^2*b*log(c*x^n) + a^
3)/(e*x^2 + d*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)^{3}}{(ex+d)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^3/((e*x + d)*x), x)
```

maple [C] time = 0.87, size = 9909, normalized size = 87.69

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^3/x/(e*x+d),x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^{3}\left(\frac{\log\left(ex+d\right)}{d}-\frac{\log(x)}{d}\right)+\int \frac{b^{3}\log(c)^{3}+b^{3}\log\left(x^{n}\right)^{3}+3\,ab^{2}\log(c)^{2}+3\,a^{2}b\log(c)+3\left(b^{3}\log(c)+ab^{2}\right)\mathrm{lo}}{ex^{2}+dx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d),x, algorithm="maxima")
```

```
[Out] -a^3*(log(e*x + d)/d - log(x)/d) + integrate((b^3*log(c)^3 + b^3*log(x^n)^3
 + 3*a*b^2*log(c)^2 + 3*a^2*b*log(c) + 3*(b^3*log(c) + a*b^2)*log(x^n)^2 +
3*(b^3*log(c)^2 + 2*a*b^2*log(c) + a^2*b)*log(x^n))/(e*x^2 + d*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(a+b\,\ln\left(c\,x^n\right)\right)}^3}{x\,\left(d+e\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^3/(x*(d + e*x)),x)
```

```
[Out] int((a + b*log(c*x^n))^3/(x*(d + e*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^{n}\right)\right)^{3}}{x\left(d+ex\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**3/x/(e*x+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))**3/(x*(d + e*x)), x)
```

3.122 $\int \frac{(a+b\log(cx^n))^3}{x(d+ex)^2}\,dx$

Optimal. Leaf size=217

$$\frac{6b^2n^2\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}+\frac{6b^2n^2\text{Li}_3\left(-\frac{d}{ex}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}+\frac{3bn\text{Li}_2\left(-\frac{d}{ex}\right)\left(a+b\log\left(cx^n\right)\right)^2}{d^2}+\frac{3bn\log\left(\frac{ex}{d}\right.}{}$$

```
[Out] -e*x*(a+b*ln(c*x^n))^3/d^2/(e*x+d)-ln(1+d/e/x)*(a+b*ln(c*x^n))^3/d^2+3*b*n*
(a+b*ln(c*x^n))^2*ln(1+e*x/d)/d^2+3*b*n*(a+b*ln(c*x^n))^2*polylog(2,-d/e/x)
/d^2+6*b^2*n^2*(a+b*ln(c*x^n))*polylog(2,-e*x/d)/d^2+6*b^2*n^2*(a+b*ln(c*x^
n))*polylog(3,-d/e/x)/d^2-6*b^3*n^3*polylog(3,-e*x/d)/d^2+6*b^3*n^3*polylog
(4,-d/e/x)/d^2
```

Rubi [A] time = 0.40, antiderivative size = 234, normalized size of antiderivative = 1.08, number of steps used = 12, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2347, 2344, 2302, 30, 2317, 2374, 2383, 6589, 2318}

$$\frac{6b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}+\frac{6b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}-\frac{3bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\right.}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^3/(x*(d + e*x)^2),x]
```

```
[Out] -((e*x*(a + b*Log[c*x^n])^3)/(d^2*(d + e*x))) + (a + b*Log[c*x^n])^4/(4*b*d
^2*n) + (3*b*n*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d^2 - ((a + b*Log[c*x
^n])^3*Log[1 + (e*x)/d])/d^2 + (6*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((
e*x)/d)])/d^2 - (3*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((e*x)/d)])/d^2 - (
6*b^3*n^3*PolyLog[3, -((e*x)/d)])/d^2 + (6*b^2*n^2*(a + b*Log[c*x^n])*PolyL
og[3, -((e*x)/d)])/d^2 - (6*b^3*n^3*PolyLog[4, -((e*x)/d)])/d^2
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2383

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^p)/q
, x] - Dist[(b*n*p)/q, Int[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^(p - 1
))/x, x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^3}{x(d+ex)^2}\,dx = \frac{\int \frac{\left(a+b\log(cx^n)\right)^3}{x(d+ex)}\,dx}{d} - \frac{e\int \frac{\left(a+b\log(cx^n)\right)^3}{(d+ex)^2}\,dx}{d}$$

$$= -\frac{ex\left(a+b\log\left(cx^n\right)\right)^3}{d^2(d+ex)} + \frac{\int \frac{\left(a+b\log(cx^n)\right)^3}{x}\,dx}{d^2} - \frac{e\int \frac{\left(a+b\log(cx^n)\right)^3}{d+ex}\,dx}{d^2} + \frac{(3ben)\int \frac{(a+b\log}{d+}}{d^2}$$

$$= -\frac{ex\left(a+b\log\left(cx^n\right)\right)^3}{d^2(d+ex)} + \frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{\left(a+b\log\left(cx^n\right)\right)^3\log}{d^2}$$

$$= -\frac{ex\left(a+b\log\left(cx^n\right)\right)^3}{d^2(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)^4}{4bd^2n} + \frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{d^2} -$$

$$= -\frac{ex\left(a+b\log\left(cx^n\right)\right)^3}{d^2(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)^4}{4bd^2n} + \frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{d^2} -$$

$$= -\frac{ex\left(a+b\log\left(cx^n\right)\right)^3}{d^2(d+ex)} + \frac{\left(a+b\log\left(cx^n\right)\right)^4}{4bd^2n} + \frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex}{d}\right)}{d^2} -$$

Mathematica [A] time = 0.50, size = 432, normalized size = 1.99

$$\frac{4b^2n^2\left(6(d+ex)\text{Li}_3\left(-\frac{ex}{d}\right)-6(\log(x)-1)(d+ex)\text{Li}_2\left(-\frac{ex}{d}\right)+\log(x)\left(\log^2(x)(d+ex)-3\log(x)\left((d+ex)\log\left(\frac{ex}{d}\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^3/(x*(d + e*x)^2),x]
```

```
[Out] (4*d*(a - b*n*Log[x] + b*Log[c*x^n])^3 + 4*(d + e*x)*Log[x]*(a - b*n*Log[x]
 + b*Log[c*x^n])^3 - 4*(d + e*x)*(a - b*n*Log[x] + b*Log[c*x^n])^3*Log[d +
e*x] + 6*b*n*(a - b*n*Log[x] + b*Log[c*x^n])^2*(-2*e*x*Log[x] + (d + e*x)*L
og[x]^2 + 2*(d + e*x)*Log[d + e*x] - 2*(d + e*x)*(Log[x]*Log[1 + (e*x)/d] +
 PolyLog[2, -((e*x)/d)])) + 4*b^2*n^2*(a - b*n*Log[x] + b*Log[c*x^n])*(Log[
x]*((d + e*x)*Log[x]^2 + 6*(d + e*x)*Log[1 + (e*x)/d] - 3*Log[x]*(e*x + (d
+ e*x)*Log[1 + (e*x)/d])) - 6*(d + e*x)*(-1 + Log[x])*PolyLog[2, -((e*x)/d)
] + 6*(d + e*x)*PolyLog[3, -((e*x)/d)]) + b^3*n^3*((d + e*x)*Log[x]^4 - 4*(
Log[x]^2*(e*x*Log[x] - 3*(d + e*x)*Log[1 + (e*x)/d]) - 6*(d + e*x)*Log[x]*P
olyLog[2, -((e*x)/d)] + 6*(d + e*x)*PolyLog[3, -((e*x)/d)]) - 4*(d + e*x)*(
Log[x]^3*Log[1 + (e*x)/d] + 3*Log[x]^2*PolyLog[2, -((e*x)/d)] - 6*Log[x]*Po
lyLog[3, -((e*x)/d)] + 6*PolyLog[4, -((e*x)/d)])))/(4*d^2*(d + e*x))
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^3\log(cx^n)^3+3\,ab^2\log(cx^n)^2+3\,a^2b\log(cx^n)+a^3}{e^2x^3+2\,dex^2+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^3*log(c*x^n)^3 + 3*a*b^2*log(c*x^n)^2 + 3*a^2*b*log(c*x^n) + a^
3)/(e^2*x^3 + 2*d*e*x^2 + d^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log(cx^n)+a\right)^3}{(ex+d)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^3/((e*x + d)^2*x), x)
```

maple [F] time = 1.05, size = 0, normalized size = 0.00

$$\int\frac{(b\ln(c\,x^n)+a)^3}{(ex+d)^2\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^3/x/(e*x+d)^2,x)
```

```
[Out] int((b*ln(c*x^n)+a)^3/x/(e*x+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a^3\left(\frac{1}{dex+d^2}-\frac{\log(ex+d)}{d^2}+\frac{\log(x)}{d^2}\right)+\int\frac{b^3\log(c)^3+b^3\log(x^n)^3+3\,ab^2\log(c)^2+3\,a^2b\log(c)+3\left(b^3\log(c)+\right.}{e^2x^3+2\,dex^2+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] a^3*(1/(d*e*x + d^2) - log(e*x + d)/d^2 + log(x)/d^2) + integrate((b^3*log(
c)^3 + b^3*log(x^n)^3 + 3*a*b^2*log(c)^2 + 3*a^2*b*log(c) + 3*(b^3*log(c) +
 a*b^2)*log(x^n)^2 + 3*(b^3*log(c)^2 + 2*a*b^2*log(c) + a^2*b)*log(x^n))/(e
^2*x^3 + 2*d*e*x^2 + d^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\ln\left(c\,x^n\right)\right)^3}{x\,\left(d+e\,x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^3/(x*(d + e*x)^2),x)
```

```
[Out] int((a + b*log(c*x^n))^3/(x*(d + e*x)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^3}{x\left(d+ex\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**3/x/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**3/(x*(d + e*x)**2), x)
```

3.123 $\int \frac{\left(a+b\log(cx^n)\right)^3}{x(d+ex)^3}\,dx$

Optimal. Leaf size=361

$$\frac{9b^2n^2\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{6b^2n^2\mathrm{Li}_3\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{3b^2n^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{3bn\mathrm{Li}_2}{}$$

```
[Out] 3/2*b*e*n*x*(a+b*ln(c*x^n))^2/d^3/(e*x+d)-1/2*(a+b*ln(c*x^n))^3/d^3+1/2*(a+
b*ln(c*x^n))^3/d/(e*x+d)^2-e*x*(a+b*ln(c*x^n))^3/d^3/(e*x+d)+1/4*(a+b*ln(c*
x^n))^4/b/d^3/n-3*b^2*n^2*(a+b*ln(c*x^n))*ln(1+e*x/d)/d^3+9/2*b*n*(a+b*ln(c
*x^n))^2*ln(1+e*x/d)/d^3-(a+b*ln(c*x^n))^3*ln(1+e*x/d)/d^3-3*b^3*n^3*polylo
g(2,-e*x/d)/d^3+9*b^2*n^2*(a+b*ln(c*x^n))*polylog(2,-e*x/d)/d^3-3*b*n*(a+b*
ln(c*x^n))^2*polylog(2,-e*x/d)/d^3-9*b^3*n^3*polylog(3,-e*x/d)/d^3+6*b^2*n^
2*(a+b*ln(c*x^n))*polylog(3,-e*x/d)/d^3-6*b^3*n^3*polylog(4,-e*x/d)/d^3
```

Rubi [A] time = 0.85, antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {2347, 2344, 2302, 30, 2317, 2374, 2383, 6589, 2318, 2319, 2391}

$$\frac{9b^2n^2\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{6b^2n^2\mathrm{PolyLog}\left(3,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{3bn\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\right.}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^3/(x*(d + e*x)^3),x]
```

```
[Out] (3*b*e*n*x*(a + b*Log[c*x^n])^2)/(2*d^3*(d + e*x)) - (a + b*Log[c*x^n])^3/(
2*d^3) + (a + b*Log[c*x^n])^3/(2*d*(d + e*x)^2) - (e*x*(a + b*Log[c*x^n])^3
)/(d^3*(d + e*x)) + (a + b*Log[c*x^n])^4/(4*b*d^3*n) - (3*b^2*n^2*(a + b*Lo
g[c*x^n])*Log[1 + (e*x)/d])/d^3 + (9*b*n*(a + b*Log[c*x^n])^2*Log[1 + (e*x)
/d])/(2*d^3) - ((a + b*Log[c*x^n])^3*Log[1 + (e*x)/d])/d^3 - (3*b^3*n^3*Pol
yLog[2, -((e*x)/d)])/d^3 + (9*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)
/d)])/d^3 - (3*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((e*x)/d)])/d^3 - (9*b^
3*n^3*PolyLog[3, -((e*x)/d)])/d^3 + (6*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3
, -((e*x)/d)])/d^3 - (6*b^3*n^3*PolyLog[4, -((e*x)/d)])/d^3
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
```

```
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2383

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^p)/q
, x] - Dist[(b*n*p)/q, Int[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^(p - 1
))/x, x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^3}{x(d+ex)^3}\,dx = \frac{\int \frac{(a+b\log(cx^n))^3}{x(d+ex)^2}dx}{d} - \frac{e\int \frac{(a+b\log(cx^n))^3}{(d+ex)^3}dx}{d}$$

$$= \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} + \frac{\int \frac{(a+b\log(cx^n))^3}{x(d+ex)}dx}{d^2} - \frac{e\int \frac{(a+b\log(cx^n))^3}{(d+ex)^2}dx}{d^2} - \frac{(3bn)\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^2}dx}{2d}$$

$$= \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^3}{d^3(d+ex)} + \frac{\int \frac{(a+b\log(cx^n))^3}{x}dx}{d^3} - \frac{e\int \frac{(a+b\log(cx^n))^3}{d+ex}dx}{d^3} -$$

$$= \frac{3benx(a+b\log(cx^n))^2}{2d^3(d+ex)} + \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^3}{d^3(d+ex)} + \frac{3bn(a+b\log}{}$$

$$= \frac{3benx(a+b\log(cx^n))^2}{2d^3(d+ex)} + \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^3}{d^3(d+ex)} + \frac{(a+b\log(cx^n}{4bd^3n}$$

$$= \frac{3benx(a+b\log(cx^n))^2}{2d^3(d+ex)} - \frac{(a+b\log(cx^n))^3}{2d^3} + \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n}{d^3(d+ex)}$$

$$= \frac{3benx(a+b\log(cx^n))^2}{2d^3(d+ex)} - \frac{(a+b\log(cx^n))^3}{2d^3} + \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n}{d^3(d+ex)}$$

Mathematica [A] time = 0.92, size = 706, normalized size = 1.96

$$\frac{2b^2n^2\left(6(d+ex)^2\text{Li}_2\left(-\frac{ex}{d}\right) - 6(d+ex)^2\left(-2\text{Li}_3\left(-\frac{ex}{d}\right) + 2\log(x)\text{Li}_2\left(-\frac{ex}{d}\right) + \log^2(x)\log\left(\frac{ex}{d}+1\right)\right) - 6(d+ex)(\log}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^3/(x*(d + e*x)^3),x]
```

```
[Out] (2*d^2*(a - b*n*Log[x] + b*Log[c*x^n])^3 + 4*d*(d + e*x)*(a - b*n*Log[x] +
b*Log[c*x^n])^3 + 4*(d + e*x)^2*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n])^3 -
4*(d + e*x)^2*(a - b*n*Log[x] + b*Log[c*x^n])^3*Log[d + e*x] + 6*b*n*(a - b
*n*Log[x] + b*Log[c*x^n])^2*((d + e*x)^2*Log[x]^2 + (d + e*x)*(-d + 3*(d +
e*x)*Log[d + e*x]) - Log[x]*(e*x*(4*d + 3*e*x) + 2*(d + e*x)^2*Log[1 + (e*x
)/d]) - 2*(d + e*x)^2*PolyLog[2, -((e*x)/d)]) + 2*b^2*n^2*(a - b*n*Log[x] +
 b*Log[c*x^n])*(-3*e*x*(2*d + e*x)*Log[x]^2 + 2*(d + e*x)^2*Log[x]^3 - 6*(d
 + e*x)^2*Log[d + e*x] + 6*(d + e*x)*Log[x]*(e*x + (d + e*x)*Log[1 + (e*x)/
d]) + 6*(d + e*x)^2*PolyLog[2, -((e*x)/d)] - 6*(d + e*x)*(Log[x]*(e*x*Log[x
] - 2*(d + e*x)*Log[1 + (e*x)/d]) - 2*(d + e*x)*PolyLog[2, -((e*x)/d)]) - 6
*(d + e*x)^2*(Log[x]^2*Log[1 + (e*x)/d] + 2*Log[x]*PolyLog[2, -((e*x)/d)] -
 2*PolyLog[3, -((e*x)/d)])) + b^3*n^3*((d + e*x)^2*Log[x]^4 - 4*(d + e*x)*(
Log[x]^2*(e*x*Log[x] - 3*(d + e*x)*Log[1 + (e*x)/d]) - 6*(d + e*x)*Log[x]*P
olyLog[2, -((e*x)/d)] + 6*(d + e*x)*PolyLog[3, -((e*x)/d)]) - 2*(Log[x]*(e*
x*(2*d + e*x)*Log[x]^2 + 6*(d + e*x)^2*Log[1 + (e*x)/d] - 3*(d + e*x)*Log[x
]*(e*x + (d + e*x)*Log[1 + (e*x)/d])) - 6*(d + e*x)^2*(-1 + Log[x])*PolyLog
[2, -((e*x)/d)] + 6*(d + e*x)^2*PolyLog[3, -((e*x)/d)]) - 4*(d + e*x)^2*(Lo
g[x]^3*Log[1 + (e*x)/d] + 3*Log[x]^2*PolyLog[2, -((e*x)/d)] - 6*Log[x]*Poly
Log[3, -((e*x)/d)] + 6*PolyLog[4, -((e*x)/d)])))/(4*d^3*(d + e*x)^2)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^3\log(cx^n)^3 + 3ab^2\log(cx^n)^2 + 3a^2b\log(cx^n) + a^3}{e^3x^4 + 3de^2x^3 + 3d^2ex^2 + d^3x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^3*log(c*x^n)^3 + 3*a*b^2*log(c*x^n)^2 + 3*a^2*b*log(c*x^n) + a^
3)/(e^3*x^4 + 3*d*e^2*x^3 + 3*d^2*e*x^2 + d^3*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log\left(cx^{n}\right) + a\right)^{3}}{\left(ex + d\right)^{3} x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^3/((e*x + d)^3*x), x)
```

maple [F] time = 1.29, size = 0, normalized size = 0.00

$$\int \frac{\left(b \ln\left(c\, x^{n}\right) + a\right)^{3}}{\left(ex + d\right)^{3} x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^3/x/(e*x+d)^3,x)
```

```
[Out] int((b*ln(c*x^n)+a)^3/x/(e*x+d)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\, a^{3}\left(\frac{2\, ex + 3\, d}{d^{2}e^{2}x^{2} + 2\, d^{3}ex + d^{4}} - \frac{2\, \log\left(ex + d\right)}{d^{3}} + \frac{2\, \log(x)}{d^{3}}\right) + \int \frac{b^{3} \log(c)^{3} + b^{3} \log\left(x^{n}\right)^{3} + 3\, ab^{2} \log(c)^{2} + 3\, a^{2}b \log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] 1/2*a^3*((2*e*x + 3*d)/(d^2*e^2*x^2 + 2*d^3*e*x + d^4) - 2*log(e*x + d)/d^3
 + 2*log(x)/d^3) + integrate((b^3*log(c)^3 + b^3*log(x^n)^3 + 3*a*b^2*log(c
)^2 + 3*a^2*b*log(c) + 3*(b^3*log(c) + a*b^2)*log(x^n)^2 + 3*(b^3*log(c)^2
+ 2*a*b^2*log(c) + a^2*b)*log(x^n))/(e^3*x^4 + 3*d*e^2*x^3 + 3*d^2*e*x^2 +
d^3*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a + b\, \ln\left(c\, x^{n}\right)\right)}^{3}}{x\, {\left(d + e\, x\right)}^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^3/(x*(d + e*x)^3),x)
```

```
[Out] int((a + b*log(c*x^n))^3/(x*(d + e*x)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \log\left(cx^{n}\right)\right)^{3}}{x \left(d + ex\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**3/x/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))**3/(x*(d + e*x)**3), x)
```

3.124 $\int (d+ex)\sqrt{a+b\log(cx^n)}\,dx$

Optimal. Leaf size=189

$$-\frac{1}{2}\sqrt{\pi}\sqrt{b}\,d\sqrt{n}\,xe^{-\frac{a}{bn}}(cx^n)^{-1/n}\,\mathrm{erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)+dx\sqrt{a+b\log(cx^n)}-\frac{1}{4}\sqrt{\frac{\pi}{2}}\sqrt{b}\,e\sqrt{n}\,x^2e^{-\frac{2a}{bn}}(cx^n)^{-2/n}\,\mathrm{erfi}\Big($$

```
[Out] -1/8*e*x^2*erfi(2^(1/2)*(a+b*ln(c*x^n))^(1/2)/b^(1/2)/n^(1/2))*b^(1/2)*n^(1
/2)*2^(1/2)*Pi^(1/2)/exp(2*a/b/n)/((c*x^n)^(2/n))-1/2*d*x*erfi((a+b*ln(c*x^
n))^(1/2)/b^(1/2)/n^(1/2))*b^(1/2)*n^(1/2)*Pi^(1/2)/exp(a/b/n)/((c*x^n)^(1/
n))+d*x*(a+b*ln(c*x^n))^(1/2)+1/2*e*x^2*(a+b*ln(c*x^n))^(1/2)
```

Rubi [A] time = 0.27, antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {2330, 2296, 2300, 2180, 2204, 2305, 2310}

$$-\frac{1}{2}\sqrt{\pi}\sqrt{b}\,d\sqrt{n}\,xe^{-\frac{a}{bn}}(cx^n)^{-1/n}\,\mathrm{Erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)+dx\sqrt{a+b\log(cx^n)}-\frac{1}{4}\sqrt{\frac{\pi}{2}}\sqrt{b}\,e\sqrt{n}\,x^2e^{-\frac{2a}{bn}}(cx^n)^{-2/n}\,\mathrm{Erfi}\Big($$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)*Sqrt[a + b*Log[c*x^n]],x]
```

```
[Out] -(Sqrt[b]*d*Sqrt[n]*Sqrt[Pi]*x*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*Sqrt[n]
)])/(2*E^(a/(b*n))*(c*x^n)^n^(-1)) - (Sqrt[b]*e*Sqrt[n]*Sqrt[Pi/2]*x^2*Erfi
[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(4*E^((2*a)/(b*n))*(c
*x^n)^(2/n)) + d*x*Sqrt[a + b*Log[c*x^n]] + (e*x^2*Sqrt[a + b*Log[c*x^n]])/
2
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2300

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_), x_Symbol] :> Dist[x/(n*(c*x
^n)^(1/n)), Subst[Int[E^(x/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[
{a, b, c, n, p}, x]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rubi steps

$$\begin{aligned}\int (d+ex)\sqrt{a+b\log(cx^n)}\,dx &= \int \left(d\sqrt{a+b\log(cx^n)}+ex\sqrt{a+b\log(cx^n)}\right)dx\\ &= d\int\sqrt{a+b\log(cx^n)}\,dx+e\int x\sqrt{a+b\log(cx^n)}\,dx\\ &= dx\sqrt{a+b\log(cx^n)}+\frac{1}{2}ex^2\sqrt{a+b\log(cx^n)}-\frac{1}{2}(bdn)\int\frac{1}{\sqrt{a+b\log(cx^n)}}\,dx\\ &= dx\sqrt{a+b\log(cx^n)}+\frac{1}{2}ex^2\sqrt{a+b\log(cx^n)}-\frac{1}{4}\left(bex^2(cx^n)^{-2/n}\right)\mathrm{Subst}\left(\int -\right.\\ &= dx\sqrt{a+b\log(cx^n)}+\frac{1}{2}ex^2\sqrt{a+b\log(cx^n)}-\frac{1}{2}\left(ex^2(cx^n)^{-2/n}\right)\mathrm{Subst}\left(\int e^{-}\right.\\ &= -\frac{1}{2}\sqrt{b}\,de^{-\frac{a}{bn}}\sqrt{n}\sqrt{\pi}\,x(cx^n)^{-1/n}\,\mathrm{erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)-\frac{1}{4}\sqrt{b}\,ee^{-\frac{2a}{bn}}\sqrt{n}\sqrt{\frac{\pi}{2}}\,x\end{aligned}$$

Mathematica [A] time = 0.28, size = 169, normalized size = 0.89

$$\frac{1}{8}x\left(4(2d+ex)\sqrt{a+b\log(cx^n)}-4\sqrt{\pi}\sqrt{b}\,d\sqrt{n}\,e^{-\frac{a}{bn}}(cx^n)^{-1/n}\,\mathrm{erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)+\sqrt{2\pi}\left(-\sqrt{b}\right)e\sqrt{n}\,xe^{-\frac{2}{b}}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)*Sqrt[a + b*Log[c*x^n]],x]
```

```
[Out] (x*((-4*Sqrt[b]*d*Sqrt[n]*Sqrt[Pi]*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*Sqr
t[n])])/(E^(a/(b*n))*(c*x^n)^n^(-1)) - (Sqrt[b]*e*Sqrt[n]*Sqrt[2*Pi]*x*Erfi
[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(E^((2*a)/(b*n))*(c*x
^n)^(2/n)) + 4*(2*d + e*x)*Sqrt[a + b*Log[c*x^n]]))/8
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex+d)\sqrt{b\log(cx^n)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)*sqrt(b*log(c*x^n) + a), x)
```

maple [F] time = 0.30, size = 0, normalized size = 0.00

$$\int (ex + d) \sqrt{b \ln (c x^n) + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(b*ln(c*x^n)+a)^(1/2),x)
```

```
[Out] int((e*x+d)*(b*ln(c*x^n)+a)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex + d)\sqrt{b \log (cx^n) + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x + d)*sqrt(b*log(c*x^n) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \sqrt{a + b\, \ln (c\, x^n)}\, (d + e\, x)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^(1/2)*(d + e*x),x)
```

```
[Out] int((a + b*log(c*x^n))^(1/2)*(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a + b \log (cx^n)}\, (d + ex)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*log(c*x**n))*(d + e*x), x)
```

3.125 $\int (d+ex)^2 \sqrt{a+b\log(cx^n)}\, dx$

Optimal. Leaf size=298

$$-\frac{1}{2}\sqrt{\pi}\,\sqrt{b}\,d^2\sqrt{n}\,xe^{-\frac{a}{bn}}\,(cx^n)^{-1/n}\operatorname{erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\,\sqrt{n}}\right)+d^2x\sqrt{a+b\log(cx^n)}-\frac{1}{2}\sqrt{\frac{\pi}{2}}\,\sqrt{b}\,de\sqrt{n}\,x^2e^{-\frac{2a}{bn}}\,(cx^n)^{-2/n}$$

```
[Out] -1/18*e^2*x^3*erfi(3^(1/2)*(a+b*ln(c*x^n))^(1/2)/b^(1/2)/n^(1/2))*b^(1/2)*n
^(1/2)*3^(1/2)*Pi^(1/2)/exp(3*a/b/n)/((c*x^n)^(3/n))-1/4*d*e*x^2*erfi(2^(1/
2)*(a+b*ln(c*x^n))^(1/2)/b^(1/2)/n^(1/2))*b^(1/2)*n^(1/2)*2^(1/2)*Pi^(1/2)/
exp(2*a/b/n)/((c*x^n)^(2/n))-1/2*d^2*x*erfi((a+b*ln(c*x^n))^(1/2)/b^(1/2)/n
^(1/2))*b^(1/2)*n^(1/2)*Pi^(1/2)/exp(a/b/n)/((c*x^n)^(1/n))+d^2*x*(a+b*ln(c
*x^n))^(1/2)+d*e*x^2*(a+b*ln(c*x^n))^(1/2)+1/3*e^2*x^3*(a+b*ln(c*x^n))^(1/2
)
```

Rubi [A] time = 0.47, antiderivative size = 298, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {2330, 2296, 2300, 2180, 2204, 2305, 2310}

$$-\frac{1}{2}\sqrt{\pi}\,\sqrt{b}\,d^2\sqrt{n}\,xe^{-\frac{a}{bn}}\,(cx^n)^{-1/n}\operatorname{Erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\,\sqrt{n}}\right)+d^2x\sqrt{a+b\log(cx^n)}-\frac{1}{2}\sqrt{\frac{\pi}{2}}\,\sqrt{b}\,de\sqrt{n}\,x^2e^{-\frac{2a}{bn}}\,(cx^n)^{-2/n}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)^2*Sqrt[a + b*Log[c*x^n]],x]
```

```
[Out] -(Sqrt[b]*d^2*Sqrt[n]*Sqrt[Pi]*x*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*Sqrt[
n])])/(2*E^(a/(b*n))*(c*x^n)^n^(-1)) - (Sqrt[b]*d*e*Sqrt[n]*Sqrt[Pi/2]*x^2*
Erfi[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(2*E^((2*a)/(b*n)
)*(c*x^n)^(2/n)) - (Sqrt[b]*e^2*Sqrt[n]*Sqrt[Pi/3]*x^3*Erfi[(Sqrt[3]*Sqrt[a
 + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(6*E^((3*a)/(b*n))*(c*x^n)^(3/n)) + d
^2*x*Sqrt[a + b*Log[c*x^n]] + d*e*x^2*Sqrt[a + b*Log[c*x^n]] + (e^2*x^3*Sqr
t[a + b*Log[c*x^n]])/3
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2300

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_), x_Symbol] :> Dist[x/(n*(c*x
^n)^(1/n)), Subst[Int[E^(x/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[
{a, b, c, n, p}, x]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rubi steps

$$\int (d+ex)^2\sqrt{a+b\log(cx^n)}\,dx = \int \left(d^2\sqrt{a+b\log(cx^n)} + 2dex\sqrt{a+b\log(cx^n)} + e^2x^2\sqrt{a+b\log(cx^n)}\right)dx$$

$$= d^2\int\sqrt{a+b\log(cx^n)}\,dx + (2de)\int x\sqrt{a+b\log(cx^n)}\,dx + e^2\int x^2\sqrt{a+b\log$$

$$= d^2x\sqrt{a+b\log(cx^n)} + dex^2\sqrt{a+b\log(cx^n)} + \frac{1}{3}e^2x^3\sqrt{a+b\log(cx^n)} - \frac{1}{2}\Big(bd^2$$

$$= d^2x\sqrt{a+b\log(cx^n)} + dex^2\sqrt{a+b\log(cx^n)} + \frac{1}{3}e^2x^3\sqrt{a+b\log(cx^n)} - \frac{1}{6}\Big(be^2$$

$$= d^2x\sqrt{a+b\log(cx^n)} + dex^2\sqrt{a+b\log(cx^n)} + \frac{1}{3}e^2x^3\sqrt{a+b\log(cx^n)} - \frac{1}{3}\Big(e^2x$$

$$= -\frac{1}{2}\sqrt{b}\,d^2e^{-\frac{a}{bn}}\sqrt{n}\sqrt{\pi}\,x\,(cx^n)^{-1/n}\,\mathrm{erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right) - \frac{1}{2}\sqrt{b}\,dee^{-\frac{2a}{bn}}\sqrt{n}\sqrt{\frac{\pi}{2}}\,x$$

Mathematica [A] time = 0.40, size = 287, normalized size = 0.96

$$\frac{1}{36}x\left(-18\sqrt{\pi}\sqrt{b}\,d^2\sqrt{n}\,e^{-\frac{a}{bn}}(cx^n)^{-1/n}\,\mathrm{erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right) + 36d^2\sqrt{a+b\log(cx^n)} - 9\sqrt{2\pi}\sqrt{b}\,de\sqrt{n}\,xe^{-\frac{2a}{bn}}(cx^n$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)^2*Sqrt[a + b*Log[c*x^n]],x]
```

```
[Out] (x*((-18*Sqrt[b]*d^2*Sqrt[n]*Sqrt[Pi]*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*
Sqrt[n])])/(E^(a/(b*n))*(c*x^n)^n^(-1)) - (9*Sqrt[b]*d*e*Sqrt[n]*Sqrt[2*Pi]
*x*Erfi[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(E^((2*a)/(b*n
))*(c*x^n)^(2/n)) - (2*Sqrt[b]*e^2*Sqrt[n]*Sqrt[3*Pi]*x^2*Erfi[(Sqrt[3]*Sqr
t[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(E^((3*a)/(b*n))*(c*x^n)^(3/n)) +
36*d^2*Sqrt[a + b*Log[c*x^n]] + 36*d*e*x*Sqrt[a + b*Log[c*x^n]] + 12*e^2*x^
2*Sqrt[a + b*Log[c*x^n]]))/36
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex+d)^2\sqrt{b\log(cx^n)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^2*sqrt(b*log(c*x^n) + a), x)
```

maple [F] time = 0.41, size = 0, normalized size = 0.00

$$\int (ex+d)^2\,\sqrt{b\ln(c\,x^n)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(b*ln(c*x^n)+a)^(1/2),x)
```

```
[Out] int((e*x+d)^2*(b*ln(c*x^n)+a)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex+d)^2\sqrt{b\log(cx^n)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x + d)^2*sqrt(b*log(c*x^n) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \sqrt{a+b\,\ln(c\,x^n)}\,(d+e\,x)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^(1/2)*(d + e*x)^2,x)
```

```
[Out] int((a + b*log(c*x^n))^(1/2)*(d + e*x)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a+b\log(cx^n)}\,(d+ex)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*log(c*x**n))*(d + e*x)**2, x)
```

3.126 $\int (d+ex)^3\sqrt{a+b\log(cx^n)}\,dx$

Optimal. Leaf size=402

$$-\frac{1}{2}\sqrt{\pi}\sqrt{b}\,d^3\sqrt{n}\,xe^{-\frac{a}{bn}}\left(cx^n\right)^{-1/n}\text{erfi}\left(\frac{\sqrt{a+b\log\left(cx^n\right)}}{\sqrt{b}\sqrt{n}}\right)+d^3x\sqrt{a+b\log\left(cx^n\right)}-\frac{3}{4}\sqrt{\frac{\pi}{2}}\sqrt{b}\,d^2e\sqrt{n}\,x^2e^{-\frac{2a}{bn}}\left(cx^n\right)^{-2/n}\text{e}$$

```
[Out] -1/6*d*e^2*x^3*erfi(3^(1/2)*(a+b*ln(c*x^n))^(1/2)/b^(1/2)/n^(1/2))*b^(1/2)*
n^(1/2)*3^(1/2)*Pi^(1/2)/exp(3*a/b/n)/((c*x^n)^(3/n))-3/8*d^2*e*x^2*erfi(2^
(1/2)*(a+b*ln(c*x^n))^(1/2)/b^(1/2)/n^(1/2))*b^(1/2)*n^(1/2)*2^(1/2)*Pi^(1/
2)/exp(2*a/b/n)/((c*x^n)^(2/n))-1/2*d^3*x*erfi((a+b*ln(c*x^n))^(1/2)/b^(1/2
)/n^(1/2))*b^(1/2)*n^(1/2)*Pi^(1/2)/exp(a/b/n)/((c*x^n)^(1/n))-1/16*e^3*x^4
*erfi(2*(a+b*ln(c*x^n))^(1/2)/b^(1/2)/n^(1/2))*b^(1/2)*n^(1/2)*Pi^(1/2)/exp
(4*a/b/n)/((c*x^n)^(4/n))+d^3*x*(a+b*ln(c*x^n))^(1/2)+3/2*d^2*e*x^2*(a+b*ln
(c*x^n))^(1/2)+d*e^2*x^3*(a+b*ln(c*x^n))^(1/2)+1/4*e^3*x^4*(a+b*ln(c*x^n))^
(1/2)
```

Rubi [A] time = 0.62, antiderivative size = 402, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {2330, 2296, 2300, 2180, 2204, 2305, 2310}

$$-\frac{3}{4}\sqrt{\frac{\pi}{2}}\sqrt{b}\,d^2e\sqrt{n}\,x^2e^{-\frac{2a}{bn}}\left(cx^n\right)^{-2/n}\text{Erfi}\left(\frac{\sqrt{2}\sqrt{a+b\log\left(cx^n\right)}}{\sqrt{b}\sqrt{n}}\right)+\frac{3}{2}d^2ex^2\sqrt{a+b\log\left(cx^n\right)}-\frac{1}{2}\sqrt{\pi}\sqrt{b}\,d^3\sqrt{n}\,xe^{-\frac{a}{bn}}\left(c\right.$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)^3*Sqrt[a + b*Log[c*x^n]],x]
```

```
[Out] -(Sqrt[b]*d^3*Sqrt[n]*Sqrt[Pi]*x*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*Sqrt[
n])])/(2*E^(a/(b*n))*(c*x^n)^n^(-1)) - (Sqrt[b]*e^3*Sqrt[n]*Sqrt[Pi]*x^4*Er
fi[(2*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(16*E^((4*a)/(b*n))*(c*x^
n)^(4/n)) - (3*Sqrt[b]*d^2*e*Sqrt[n]*Sqrt[Pi/2]*x^2*Erfi[(Sqrt[2]*Sqrt[a +
b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(4*E^((2*a)/(b*n))*(c*x^n)^(2/n)) - (Sqr
t[b]*d*e^2*Sqrt[n]*Sqrt[Pi/3]*x^3*Erfi[(Sqrt[3]*Sqrt[a + b*Log[c*x^n]])/(Sq
rt[b]*Sqrt[n])])/(2*E^((3*a)/(b*n))*(c*x^n)^(3/n)) + d^3*x*Sqrt[a + b*Log[c
*x^n]] + (3*d^2*e*x^2*Sqrt[a + b*Log[c*x^n]])/2 + d*e^2*x^3*Sqrt[a + b*Log[
c*x^n]] + (e^3*x^4*Sqrt[a + b*Log[c*x^n]])/4
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2300

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_), x_Symbol] :> Dist[x/(n*(c*x
^n)^(1/n)), Subst[Int[E^(x/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[
```

```
{a, b, c, n, p}, x]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rubi steps

$$\int (d+ex)^3\sqrt{a+b\log(cx^n)}\,dx = \int \Big(d^3\sqrt{a+b\log(cx^n)} + 3d^2ex\sqrt{a+b\log(cx^n)} + 3de^2x^2\sqrt{a+b\log(cx^n)}\ \cdots$$

$$= d^3\int\sqrt{a+b\log(cx^n)}\,dx + \left(3d^2e\right)\int x\sqrt{a+b\log(cx^n)}\,dx + \left(3de^2\right)\int x^2\sqrt{\cdots}$$

$$= d^3x\sqrt{a+b\log(cx^n)} + \frac{3}{2}d^2ex^2\sqrt{a+b\log(cx^n)} + de^2x^3\sqrt{a+b\log(cx^n)} + \cdots$$

$$= d^3x\sqrt{a+b\log(cx^n)} + \frac{3}{2}d^2ex^2\sqrt{a+b\log(cx^n)} + de^2x^3\sqrt{a+b\log(cx^n)} + \cdots$$

$$= d^3x\sqrt{a+b\log(cx^n)} + \frac{3}{2}d^2ex^2\sqrt{a+b\log(cx^n)} + de^2x^3\sqrt{a+b\log(cx^n)} + \cdots$$

$$= -\frac{1}{2}\sqrt{b}\,d^3e^{-\frac{a}{bn}}\sqrt{n}\,\sqrt{\pi}\,x\,(cx^n)^{-1/n}\operatorname{erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\,\sqrt{n}}\right) - \frac{1}{16}\sqrt{b}\,e^3e^{-\frac{4a}{bn}}\sqrt{n}\,\sqrt{\cdots}$$

Mathematica [A] time = 0.51, size = 366, normalized size = 0.91

$$\frac{1}{48}xe^{-\frac{4a}{bn}}(cx^n)^{-4/n}\left(-24\sqrt{\pi}\,\sqrt{b}\,d^3\sqrt{n}\,e^{\frac{3a}{bn}}(cx^n)^{3/n}\operatorname{erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\,\sqrt{n}}\right) + 2e^{\frac{a}{bn}}(cx^n)^{\frac{1}{n}}\left(-9\sqrt{2\pi}\,\sqrt{b}\,d^2e\sqrt{n}\,xe^{\frac{a}{bn}}\cdots\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)^3*Sqrt[a + b*Log[c*x^n]],x]
```

```
[Out] (x*(-24*Sqrt[b]*d^3*E^((3*a)/(b*n))*Sqrt[n]*Sqrt[Pi]*(c*x^n)^(3/n)*Erfi[Sqr
t[a + b*Log[c*x^n]]/(Sqrt[b]*Sqrt[n])] - 3*Sqrt[b]*e^3*Sqrt[n]*Sqrt[Pi]*x^3
*Erfi[(2*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])] + 2*E^(a/(b*n))*(c*x^n)
^n^(-1)*(-9*Sqrt[b]*d^2*e*E^(a/(b*n))*Sqrt[n]*Sqrt[2*Pi]*x*(c*x^n)^n^(-1)*E
rfi[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])] - 4*Sqrt[b]*d*e^2*S
qrt[n]*Sqrt[3*Pi]*x^2*Erfi[(Sqrt[3]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n
])] + 6*E^((3*a)/(b*n))*(c*x^n)^(3/n)*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 + e^
3*x^3)*Sqrt[a + b*Log[c*x^n]])))/(48*E^((4*a)/(b*n))*(c*x^n)^(4/n))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex+d)^3 \sqrt{b \log(cx^n) + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^3*sqrt(b*log(c*x^n) + a), x)
```

maple [F] time = 0.40, size = 0, normalized size = 0.00

$$\int (ex+d)^3 \sqrt{b \ln(c x^n) + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(b*ln(c*x^n)+a)^(1/2),x)
```

```
[Out] int((e*x+d)^3*(b*ln(c*x^n)+a)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex+d)^3 \sqrt{b \log(cx^n) + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x + d)^3*sqrt(b*log(c*x^n) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \sqrt{a + b\, \ln(c\, x^n)}\, (d + e\, x)^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^(1/2)*(d + e*x)^3,x)
```

```
[Out] int((a + b*log(c*x^n))^(1/2)*(d + e*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a + b \log(cx^n)}\, (d + ex)^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*log(c*x**n))*(d + e*x)**3, x)
```

3.127 $\int \frac{\sqrt{a+b\log(cx^n)}}{d+ex}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{\sqrt{a+b\log(cx^n)}}{d+ex},x\right)$$

```
[Out] Unintegrable((a+b*ln(c*x^n))^(1/2)/(e*x+d),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{a+b\log(cx^n)}}{d+ex}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[a + b*Log[c*x^n]]/(d + e*x),x]
[Out] Defer[Int][Sqrt[a + b*Log[c*x^n]]/(d + e*x), x]
```

Rubi steps

$$\int \frac{\sqrt{a+b\log(cx^n)}}{d+ex}\,dx=\int \frac{\sqrt{a+b\log(cx^n)}}{d+ex}\,dx$$

Mathematica [A] time = 6.36, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a+b\log(cx^n)}}{d+ex}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x),x]
[Out] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{b\log(cx^n)+a}}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d),x, algorithm="giac")
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d), x)
```

maple [A] time = 0.45, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{b \ln \left(c\,x^{n}\right)+a}}{ex+d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^(1/2)/(e*x+d),x)
[Out] int((b*ln(c*x^n)+a)^(1/2)/(e*x+d),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{b \log \left(cx^{n}\right)+a}}{ex+d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d),x, algorithm="maxima")
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{a+b\,\ln \left(c\,x^{n}\right)}}{d+e\,x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^(1/2)/(d + e*x),x)
[Out] int((a + b*log(c*x^n))^(1/2)/(d + e*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a+b \log \left(cx^{n}\right)}}{d+ex}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**(1/2)/(e*x+d),x)
[Out] Integral(sqrt(a + b*log(c*x**n))/(d + e*x), x)
```

3.128 $\int \frac{\sqrt{a+b\log(cx^n)}}{(d+ex)^2}\,dx$

Optimal. Leaf size=61

$$\frac{x\sqrt{a+b\log(cx^n)}}{d(d+ex)}-\frac{bn\mathrm{Int}\left(\frac{1}{(d+ex)\sqrt{a+b\log(cx^n)}},x\right)}{2d}$$

```
[Out] x*(a+b*ln(c*x^n))^(1/2)/d/(e*x+d)-1/2*b*n*Unintegrable(1/(e*x+d)/(a+b*ln(c*
x^n))^(1/2),x)/d
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{a+b\log(cx^n)}}{(d+ex)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^2,x]
```

```
[Out] (x*Sqrt[a + b*Log[c*x^n]])/(d*(d + e*x)) - (b*n*Defer[Int][1/((d + e*x)*Sqr
t[a + b*Log[c*x^n]]), x])/(2*d)
```

Rubi steps

$$\int \frac{\sqrt{a+b\log(cx^n)}}{(d+ex)^2}\,dx=\frac{x\sqrt{a+b\log(cx^n)}}{d(d+ex)}-\frac{(bn)\int \frac{1}{(d+ex)\sqrt{a+b\log(cx^n)}}\,dx}{2d}$$

Mathematica [A] time = 6.80, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a+b\log(cx^n)}}{(d+ex)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^2,x]
```

```
[Out] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^2, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{b\log(cx^n)+a}}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d)^2, x)
```

maple [A] time = 0.41, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{b \ln (c\, x^{n})+a}}{(ex+d)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^(1/2)/(e*x+d)^2,x)
```

```
[Out] int((b*ln(c*x^n)+a)^(1/2)/(e*x+d)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{b \log (cx^{n})+a}}{(ex+d)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\sqrt{a+b\, \ln (c\, x^{n})}}{(d+e\, x)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^(1/2)/(d + e*x)^2,x)
```

```
[Out] int((a + b*log(c*x^n))^(1/2)/(d + e*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a+b \log (cx^{n})}}{(d+ex)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**(1/2)/(e*x+d)**2,x)
```

```
[Out] Integral(sqrt(a + b*log(c*x**n))/(d + e*x)**2, x)
```

3.129 $\int \frac{\sqrt{a+b\log(cx^n)}}{(d+ex)^3}\,dx$

Optimal. Leaf size=66

$$\frac{bn\mathrm{Int}\left(\frac{1}{x(d+ex)^2\sqrt{a+b\log(cx^n)}},x\right)}{4e}-\frac{\sqrt{a+b\log(cx^n)}}{2e(d+ex)^2}$$

```
[Out] -1/2*(a+b*ln(c*x^n))^(1/2)/e/(e*x+d)^2+1/4*b*n*Unintegrable(1/x/(e*x+d)^2/(
a+b*ln(c*x^n))^(1/2),x)/e
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{a+b\log(cx^n)}}{(d+ex)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^3,x]
```

```
[Out] -Sqrt[a + b*Log[c*x^n]]/(2*e*(d + e*x)^2) + (b*n*Defer[Int][1/(x*(d + e*x)^
2*Sqrt[a + b*Log[c*x^n]]), x])/(4*e)
```

Rubi steps

$$\int \frac{\sqrt{a+b\log(cx^n)}}{(d+ex)^3}\,dx=-\frac{\sqrt{a+b\log(cx^n)}}{2e(d+ex)^2}+\frac{(bn)\int \frac{1}{x(d+ex)^2\sqrt{a+b\log(cx^n)}}\,dx}{4e}$$

Mathematica [A] time = 13.35, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a+b\log(cx^n)}}{(d+ex)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^3,x]
```

```
[Out] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^3, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{b\log(cx^n)+a}}{(ex+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d)^3, x)
```

maple [A] time = 0.43, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{b\ln\left(c\,x^{n}\right)+a}}{\left(ex+d\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^(1/2)/(e*x+d)^3,x)
```

```
[Out] int((b*ln(c*x^n)+a)^(1/2)/(e*x+d)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{b\log\left(cx^{n}\right)+a}}{\left(ex+d\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\sqrt{a+b\,\ln\left(c\,x^{n}\right)}}{\left(d+e\,x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^(1/2)/(d + e*x)^3,x)
```

```
[Out] int((a + b*log(c*x^n))^(1/2)/(d + e*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a+b\log\left(cx^{n}\right)}}{\left(d+ex\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**(1/2)/(e*x+d)**3,x)
```

```
[Out] Integral(sqrt(a + b*log(c*x**n))/(d + e*x)**3, x)
```

3.130 $\int x^3\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=242

$$-\frac{2d^3(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^4}+\frac{6d^2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}-\frac{6d(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^4}+\frac{2(d+ex)^{9/}}{}$$

```
[Out] 64/945*b*d^3*n*(e*x+d)^(3/2)/e^4-356/1575*b*d^2*n*(e*x+d)^(5/2)/e^4+80/441*
b*d*n*(e*x+d)^(7/2)/e^4-4/81*b*n*(e*x+d)^(9/2)/e^4-64/315*b*d^(9/2)*n*arcta
nh((e*x+d)^(1/2)/d^(1/2))/e^4-2/3*d^3*(e*x+d)^(3/2)*(a+b*ln(c*x^n))/e^4+6/5
*d^2*(e*x+d)^(5/2)*(a+b*ln(c*x^n))/e^4-6/7*d*(e*x+d)^(7/2)*(a+b*ln(c*x^n))/
e^4+2/9*(e*x+d)^(9/2)*(a+b*ln(c*x^n))/e^4+64/315*b*d^4*n*(e*x+d)^(1/2)/e^4
```

Rubi [A] time = 0.22, antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {43, 2350, 12, 1620, 50, 63, 208}

$$-\frac{2d^3(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^4}+\frac{6d^2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}-\frac{6d(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^4}+\frac{2(d+ex)^{9/}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (64*b*d^4*n*Sqrt[d + e*x])/(315*e^4) + (64*b*d^3*n*(d + e*x)^(3/2))/(945*e^
4) - (356*b*d^2*n*(d + e*x)^(5/2))/(1575*e^4) + (80*b*d*n*(d + e*x)^(7/2))/
(441*e^4) - (4*b*n*(d + e*x)^(9/2))/(81*e^4) - (64*b*d^(9/2)*n*ArcTanh[Sqrt
[d + e*x]/Sqrt[d]])/(315*e^4) - (2*d^3*(d + e*x)^(3/2)*(a + b*Log[c*x^n]))/
(3*e^4) + (6*d^2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4) - (6*d*(d + e*
x)^(7/2)*(a + b*Log[c*x^n]))/(7*e^4) + (2*(d + e*x)^(9/2)*(a + b*Log[c*x^n]
))/(9*e^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
```

```
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int x^3\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)dx = -\frac{2d^3(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^4}+\frac{6d^2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}-\frac{6d(d+\cdots}{\cdots}$$

$$= -\frac{2d^3(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^4}+\frac{6d^2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}-\frac{6d(d+\cdots}{\cdots}$$

$$= -\frac{2d^3(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^4}+\frac{6d^2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}-\frac{6d(d+\cdots}{\cdots}$$

$$= -\frac{356bd^2n(d+ex)^{5/2}}{1575e^4}+\frac{80bdn(d+ex)^{7/2}}{441e^4}-\frac{4bn(d+ex)^{9/2}}{81e^4}-\frac{2d^3(d+ex)^{3/2}(\cdots}{3\cdots}$$

$$= \frac{64bd^3n(d+ex)^{3/2}}{945e^4}-\frac{356bd^2n(d+ex)^{5/2}}{1575e^4}+\frac{80bdn(d+ex)^{7/2}}{441e^4}-\frac{4bn(d+ex)^{9/\cdots}}{81e^4}$$

$$= \frac{64bd^4n\sqrt{d+ex}}{315e^4}+\frac{64bd^3n(d+ex)^{3/2}}{945e^4}-\frac{356bd^2n(d+ex)^{5/2}}{1575e^4}+\frac{80bdn(d+ex\cdots}{441e^4}$$

$$= \frac{64bd^4n\sqrt{d+ex}}{315e^4}+\frac{64bd^3n(d+ex)^{3/2}}{945e^4}-\frac{356bd^2n(d+ex)^{5/2}}{1575e^4}+\frac{80bdn(d+ex\cdots}{441e^4}$$

$$= \frac{64bd^4n\sqrt{d+ex}}{315e^4}+\frac{64bd^3n(d+ex)^{3/2}}{945e^4}-\frac{356bd^2n(d+ex)^{5/2}}{1575e^4}+\frac{80bdn(d+ex\cdots}{441e^4}$$

Mathematica [A] time = 0.47, size = 183, normalized size = 0.76

$$-\frac{2\left(\sqrt{d+ex}\left(315a\left(16d^4-8d^3ex+6d^2e^2x^2-5de^3x^3-35e^4x^4\right)+315b\left(16d^4-8d^3ex+6d^2e^2x^2-5de^3x^3-35e^4\cdots\right.\right.\right.}{992\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-2*(10080*b*d^(9/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(315*
a*(16*d^4 - 8*d^3*e*x + 6*d^2*e^2*x^2 - 5*d*e^3*x^3 - 35*e^4*x^4) + 2*b*n*(
-4388*d^4 + 934*d^3*e*x - 543*d^2*e^2*x^2 + 400*d*e^3*x^3 + 1225*e^4*x^4) +
 315*b*(16*d^4 - 8*d^3*e*x + 6*d^2*e^2*x^2 - 5*d*e^3*x^3 - 35*e^4*x^4)*Log[
c*x^n])))/(99225*e^4)
```

fricas [A] time = 0.74, size = 495, normalized size = 2.05

$$\left[\frac{2\left(5040\,bd^{\frac{9}{2}}n\log\left(\frac{ex-2\,\sqrt{ex+d}\,\sqrt{d}+2\,d}{x}\right)+\left(8776\,bd^4n-5040\,ad^4-1225\left(2\,be^4n-9\,ae^4\right)x^4-25\left(32\,bde^3n-63\,a\right.\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/99225*(5040*b*d^(9/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (
8776*b*d^4*n - 5040*a*d^4 - 1225*(2*b*e^4*n - 9*a*e^4)*x^4 - 25*(32*b*d*e^3
*n - 63*a*d*e^3)*x^3 + 6*(181*b*d^2*e^2*n - 315*a*d^2*e^2)*x^2 - 4*(467*b*d
^3*e*n - 630*a*d^3*e)*x + 315*(35*b*e^4*x^4 + 5*b*d*e^3*x^3 - 6*b*d^2*e^2*x
^2 + 8*b*d^3*e*x - 16*b*d^4)*log(c) + 315*(35*b*e^4*n*x^4 + 5*b*d*e^3*n*x^3
 - 6*b*d^2*e^2*n*x^2 + 8*b*d^3*e*n*x - 16*b*d^4*n)*log(x))*sqrt(e*x + d))/e
^4, 2/99225*(10080*b*sqrt(-d)*d^4*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (877
6*b*d^4*n - 5040*a*d^4 - 1225*(2*b*e^4*n - 9*a*e^4)*x^4 - 25*(32*b*d*e^3*n
- 63*a*d*e^3)*x^3 + 6*(181*b*d^2*e^2*n - 315*a*d^2*e^2)*x^2 - 4*(467*b*d^3*
e*n - 630*a*d^3*e)*x + 315*(35*b*e^4*x^4 + 5*b*d*e^3*x^3 - 6*b*d^2*e^2*x^2
+ 8*b*d^3*e*x - 16*b*d^4)*log(c) + 315*(35*b*e^4*n*x^4 + 5*b*d*e^3*n*x^3 -
6*b*d^2*e^2*n*x^2 + 8*b*d^3*e*n*x - 16*b*d^4*n)*log(x))*sqrt(e*x + d))/e^4]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{ex+d}\,\left(b\log\left(cx^n\right)+a\right)x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)*x^3, x)
```

maple [F] time = 0.49, size = 0, normalized size = 0.00

$$\int\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{ex+d}\;x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)*(e*x+d)^(1/2),x)
```

```
[Out] int(x^3*(b*ln(c*x^n)+a)*(e*x+d)^(1/2),x)
```

maxima [A] time = 1.37, size = 227, normalized size = 0.94

$$\frac{4}{99225}\left(\frac{2520\,d^{\frac{9}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^4}-\frac{1225\,(ex+d)^{\frac{9}{2}}-4500\,(ex+d)^{\frac{7}{2}}d+5607\,(ex+d)^{\frac{5}{2}}d^2-1680\,(ex+d)^{\frac{3}{2}}d^3-}{e^4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 4/99225*(2520*d^(9/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d
)))/e^4 - (1225*(e*x + d)^(9/2) - 4500*(e*x + d)^(7/2)*d + 5607*(e*x + d)^(
5/2)*d^2 - 1680*(e*x + d)^(3/2)*d^3 - 5040*sqrt(e*x + d)*d^4)/e^4)*b*n + 2/
315*b*(35*(e*x + d)^(9/2)/e^4 - 135*(e*x + d)^(7/2)*d/e^4 + 189*(e*x + d)^(
5/2)*d^2/e^4 - 105*(e*x + d)^(3/2)*d^3/e^4)*log(c*x^n) + 2/315*a*(35*(e*x +
 d)^(9/2)/e^4 - 135*(e*x + d)^(7/2)*d/e^4 + 189*(e*x + d)^(5/2)*d^2/e^4 - 1
05*(e*x + d)^(3/2)*d^3/e^4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,\sqrt{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*log(c*x^n))*(d + e*x)^(1/2),x)
```

```
[Out] int(x^3*(a + b*log(c*x^n))*(d + e*x)^(1/2), x)
```

sympy [B] time = 16.49, size = 518, normalized size = 2.14

$$2\left(-\frac{ad^3(d+ex)^{\frac{3}{2}}}{3}+\frac{3ad^2(d+ex)^{\frac{5}{2}}}{5}-\frac{3ad(d+ex)^{\frac{7}{2}}}{7}+\frac{a(d+ex)^{\frac{9}{2}}}{9}-bd^3\left(\frac{(d+ex)^{\frac{3}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{3}-\frac{2n\left(\frac{d^2e\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}+de\sqrt{d+ex}+\frac{e(d+ex)^{\frac{3}{2}}}{3}\right.}{3e}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))*(e*x+d)**(1/2),x)
```

```
[Out] 2*(-a*d**3*(d + e*x)**(3/2)/3 + 3*a*d**2*(d + e*x)**(5/2)/5 - 3*a*d*(d + e*
x)**(7/2)/7 + a*(d + e*x)**(9/2)/9 - b*d**3*((d + e*x)**(3/2)*log(c*(-d/e +
 (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d
*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)) + 3*b*d**2*((d + e*x)**(5/2
)*log(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*x)/sqrt(-d
))/sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(d + e*x)**
(5/2)/5)/(5*e)) - 3*b*d*((d + e*x)**(7/2)*log(c*(-d/e + (d + e*x)/e)**n)/7
- 2*n*(d**4*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**3*e*sqrt(d + e*x)
+ d**2*e*(d + e*x)**(3/2)/3 + d*e*(d + e*x)**(5/2)/5 + e*(d + e*x)**(7/2)/7
)/(7*e)) + b*((d + e*x)**(9/2)*log(c*(-d/e + (d + e*x)/e)**n)/9 - 2*n*(d**5
*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**4*e*sqrt(d + e*x) + d**3*e*(d
 + e*x)**(3/2)/3 + d**2*e*(d + e*x)**(5/2)/5 + d*e*(d + e*x)**(7/2)/7 + e*(
d + e*x)**(9/2)/9)/(9*e)))/e**4
```

3.131 $\int x^2\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=192

$$\frac{2d^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}-\frac{4d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3}+\frac{2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3}+\frac{32bd^{7/2}n\tanh}{105e}$$

```
[Out] -32/315*b*d^2*n*(e*x+d)^(3/2)/e^3+36/175*b*d*n*(e*x+d)^(5/2)/e^3-4/49*b*n*(
e*x+d)^(7/2)/e^3+32/105*b*d^(7/2)*n*arctanh((e*x+d)^(1/2)/d^(1/2))/e^3+2/3*
d^2*(e*x+d)^(3/2)*(a+b*ln(c*x^n))/e^3-4/5*d*(e*x+d)^(5/2)*(a+b*ln(c*x^n))/e
^3+2/7*(e*x+d)^(7/2)*(a+b*ln(c*x^n))/e^3-32/105*b*d^3*n*(e*x+d)^(1/2)/e^3
```

Rubi [A] time = 0.18, antiderivative size = 192, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {43, 2350, 12, 897, 1261, 208}

$$\frac{2d^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}-\frac{4d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3}+\frac{2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3}-\frac{32bd^3n\sqrt{d+e}}{105e^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-32*b*d^3*n*Sqrt[d + e*x])/(105*e^3) - (32*b*d^2*n*(d + e*x)^(3/2))/(315*e
^3) + (36*b*d*n*(d + e*x)^(5/2))/(175*e^3) - (4*b*n*(d + e*x)^(7/2))/(49*e^
3) + (32*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(105*e^3) + (2*d^2*(d
+ e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) - (4*d*(d + e*x)^(5/2)*(a + b*Log[
c*x^n]))/(5*e^3) + (2*(d + e*x)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
```

```
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int x^2\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)\,dx = \frac{2d^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} - \frac{4d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} + \frac{2(d+ex)}{}$$

$$= \frac{2d^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} - \frac{4d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} + \frac{2(d+ex)}{}$$

$$= \frac{2d^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} - \frac{4d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} + \frac{2(d+ex)}{}$$

$$= \frac{2d^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} - \frac{4d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} + \frac{2(d+ex)}{}$$

$$= -\frac{32bd^3n\sqrt{d+ex}}{105e^3} - \frac{32bd^2n(d+ex)^{3/2}}{315e^3} + \frac{36bdn(d+ex)^{5/2}}{175e^3} - \frac{4bn(d+ex)^{7/2}}{49e^3}$$

$$= -\frac{32bd^3n\sqrt{d+ex}}{105e^3} - \frac{32bd^2n(d+ex)^{3/2}}{315e^3} + \frac{36bdn(d+ex)^{5/2}}{175e^3} - \frac{4bn(d+ex)^{7/2}}{49e^3}$$

Mathematica [A] time = 0.22, size = 151, normalized size = 0.79

$$\frac{2\sqrt{d+ex}\,\left(105a\left(8d^3-4d^2ex+3de^2x^2+15e^3x^3\right)+105b\left(8d^3-4d^2ex+3de^2x^2+15e^3x^3\right)\log\left(cx^n\right)-2bn\left(778d^3\right.\right.}{11025e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (3360*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*Sqrt[d + e*x]*(105*a*(
8*d^3 - 4*d^2*e*x + 3*d*e^2*x^2 + 15*e^3*x^3) - 2*b*n*(778*d^3 - 179*d^2*e*
x + 108*d*e^2*x^2 + 225*e^3*x^3) + 105*b*(8*d^3 - 4*d^2*e*x + 3*d*e^2*x^2 +
 15*e^3*x^3)*Log[c*x^n]))/(11025*e^3)
```

fricas [A] time = 0.72, size = 396, normalized size = 2.06

$$\left[\frac{2\left(840\,bd^{\frac{7}{2}}n\log\left(\frac{ex+2\,\sqrt{ex+d}\,\sqrt{d}+2\,d}{x}\right)-\left(1556\,bd^3n-840\,ad^3+225\left(2\,be^3n-7\,ae^3\right)x^3+9\left(24\,bde^2n-35\,ade^2\right)x^2\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/11025*(840*b*d^(7/2)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - (1
556*b*d^3*n - 840*a*d^3 + 225*(2*b*e^3*n - 7*a*e^3)*x^3 + 9*(24*b*d*e^2*n -
 35*a*d*e^2)*x^2 - 2*(179*b*d^2*e*n - 210*a*d^2*e)*x - 105*(15*b*e^3*x^3 +
3*b*d*e^2*x^2 - 4*b*d^2*e*x + 8*b*d^3)*log(c) - 105*(15*b*e^3*n*x^3 + 3*b*d
*e^2*n*x^2 - 4*b*d^2*e*n*x + 8*b*d^3*n)*log(x))*sqrt(e*x + d))/e^3, -2/1102
5*(1680*b*sqrt(-d)*d^3*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (1556*b*d^3*n -
 840*a*d^3 + 225*(2*b*e^3*n - 7*a*e^3)*x^3 + 9*(24*b*d*e^2*n - 35*a*d*e^2)*
x^2 - 2*(179*b*d^2*e*n - 210*a*d^2*e)*x - 105*(15*b*e^3*x^3 + 3*b*d*e^2*x^2
 - 4*b*d^2*e*x + 8*b*d^3)*log(c) - 105*(15*b*e^3*n*x^3 + 3*b*d*e^2*n*x^2 -
4*b*d^2*e*n*x + 8*b*d^3*n)*log(x))*sqrt(e*x + d))/e^3]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ex+d}\left(b\log\left(cx^{n}\right)+a\right)x^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)*x^2, x)
```

maple [F] time = 0.47, size = 0, normalized size = 0.00

$$\int \left(b\ln\left(c\,x^{n}\right)+a\right)\sqrt{ex+d}\;x^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)*(e*x+d)^(1/2),x)
```

```
[Out] int(x^2*(b*ln(c*x^n)+a)*(e*x+d)^(1/2),x)
```

maxima [A] time = 1.36, size = 184, normalized size = 0.96

$$-\frac{4}{11025}\left(\frac{420\,d^{\frac{7}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^{3}}+\frac{225\,(ex+d)^{\frac{7}{2}}-567\,(ex+d)^{\frac{5}{2}}d+280\,(ex+d)^{\frac{3}{2}}d^{2}+840\,\sqrt{ex+d}\,d^{3}}{e^{3}}\right)bn+\frac{}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -4/11025*(420*d^(7/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d
)))/e^3 + (225*(e*x + d)^(7/2) - 567*(e*x + d)^(5/2)*d + 280*(e*x + d)^(3/2
)*d^2 + 840*sqrt(e*x + d)*d^3)/e^3)*b*n + 2/105*b*(15*(e*x + d)^(7/2)/e^3 -
 42*(e*x + d)^(5/2)*d/e^3 + 35*(e*x + d)^(3/2)*d^2/e^3)*log(c*x^n) + 2/105*
a*(15*(e*x + d)^(7/2)/e^3 - 42*(e*x + d)^(5/2)*d/e^3 + 35*(e*x + d)^(3/2)*d
^2/e^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^{2}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)\,\sqrt{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*log(c*x^n))*(d + e*x)^(1/2),x)
```

```
[Out] int(x^2*(a + b*log(c*x^n))*(d + e*x)^(1/2), x)
```

sympy [A] time = 11.16, size = 364, normalized size = 1.90

$$2\left(\frac{ad^2(d+ex)^{\frac{3}{2}}}{3}-\frac{2ad(d+ex)^{\frac{5}{2}}}{5}+\frac{a(d+ex)^{\frac{7}{2}}}{7}+bd^2\left(\frac{(d+ex)^{\frac{3}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{3}-\frac{2n\left(\frac{d^2e\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}+de\sqrt{d+ex}+\frac{e(d+ex)^{\frac{3}{2}}}{3}\right)}{3e}\right)-2bd\left(\frac{(d+ex}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))*(e*x+d)**(1/2),x)
```

```
[Out] 2*(a*d**2*(d + e*x)**(3/2)/3 - 2*a*d*(d + e*x)**(5/2)/5 + a*(d + e*x)**(7/2
)/7 + b*d**2*((d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2
*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)*
*(3/2)/3)/(3*e)) - 2*b*d*((d + e*x)**(5/2)*log(c*(-d/e + (d + e*x)/e)**n)/5
 - 2*n*(d**3*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**2*e*sqrt(d + e*x)
 + d*e*(d + e*x)**(3/2)/3 + e*(d + e*x)**(5/2)/5)/(5*e)) + b*((d + e*x)**(7
/2)*log(c*(-d/e + (d + e*x)/e)**n)/7 - 2*n*(d**4*e*atan(sqrt(d + e*x)/sqrt(
-d))/sqrt(-d) + d**3*e*sqrt(d + e*x) + d**2*e*(d + e*x)**(3/2)/3 + d*e*(d +
 e*x)**(5/2)/5 + e*(d + e*x)**(7/2)/7)/(7*e)))/e**3
```

3.132 $\int x\sqrt{d+ex}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=142

$$-\frac{2d(d+ex)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}-\frac{8bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{15e^2}+\frac{8bd^2n\sqrt{d+ex}}{15e^2}+\frac{8ba}{}$$

```
[Out] 8/45*b*d*n*(e*x+d)^(3/2)/e^2-4/25*b*n*(e*x+d)^(5/2)/e^2-8/15*b*d^(5/2)*n*ar
ctanh((e*x+d)^(1/2)/d^(1/2))/e^2-2/3*d*(e*x+d)^(3/2)*(a+b*ln(c*x^n))/e^2+2/
5*(e*x+d)^(5/2)*(a+b*ln(c*x^n))/e^2+8/15*b*d^2*n*(e*x+d)^(1/2)/e^2
```

Rubi [A] time = 0.10, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {43, 2350, 12, 80, 50, 63, 208}

$$-\frac{2d(d+ex)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{8bd^2n\sqrt{d+ex}}{15e^2}-\frac{8bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{15e^2}+\frac{8ba}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (8*b*d^2*n*Sqrt[d + e*x])/(15*e^2) + (8*b*d*n*(d + e*x)^(3/2))/(45*e^2) - (
4*b*n*(d + e*x)^(5/2))/(25*e^2) - (8*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt
[d]])/(15*e^2) - (2*d*(d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2) + (2*(d +
 e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
```

```
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int x\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)dx = -\frac{2d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}-(bn)\int \frac{2(d}{}$$

$$= -\frac{2d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}-\frac{(2bn)\int \frac{(d+}{}}{}$$

$$= -\frac{4bn(d+ex)^{5/2}}{25e^2}-\frac{2d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx\right.\right.}{5e^2}$$

$$= \frac{8bdn(d+ex)^{3/2}}{45e^2}-\frac{4bn(d+ex)^{5/2}}{25e^2}-\frac{2d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}+\frac{2(d+ex}{}$$

$$= \frac{8bd^2n\sqrt{d+ex}}{15e^2}+\frac{8bdn(d+ex)^{3/2}}{45e^2}-\frac{4bn(d+ex)^{5/2}}{25e^2}-\frac{2d(d+ex)^{3/2}\left(a+b\log\right.}{3e^2}$$

$$= \frac{8bd^2n\sqrt{d+ex}}{15e^2}+\frac{8bdn(d+ex)^{3/2}}{45e^2}-\frac{4bn(d+ex)^{5/2}}{25e^2}-\frac{2d(d+ex)^{3/2}\left(a+b\log\right.}{3e^2}$$

$$= \frac{8bd^2n\sqrt{d+ex}}{15e^2}+\frac{8bdn(d+ex)^{3/2}}{45e^2}-\frac{4bn(d+ex)^{5/2}}{25e^2}-\frac{8bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{15e^2}$$

Mathematica [A] time = 0.13, size = 116, normalized size = 0.82

$$\frac{2\sqrt{d+ex}\left(15a\left(-2d^2+dex+3e^2x^2\right)+15b\left(-2d^2+dex+3e^2x^2\right)\log\left(cx^n\right)+2bn\left(31d^2-8dex-9e^2x^2\right)\right)-120bd}{225e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-120*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*Sqrt[d + e*x]*(2*b*n*(
31*d^2 - 8*d*e*x - 9*e^2*x^2) + 15*a*(-2*d^2 + d*e*x + 3*e^2*x^2) + 15*b*(-
2*d^2 + d*e*x + 3*e^2*x^2)*Log[c*x^n]))/(225*e^2)
```

fricas [A] time = 0.55, size = 291, normalized size = 2.05

$$\left[\frac{2\left(30\,bd^{\frac{5}{2}}n\log\left(\frac{ex-2\,\sqrt{ex+d}\,\sqrt{d}+2\,d}{x}\right)+\left(62\,bd^2n-30\,ad^2-9\left(2\,be^2n-5\,ae^2\right)x^2-(16\,bden-15\,ade)x+15\left(3\,be^2\right.\right.\right.}{225\,e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/225*(30*b*d^(5/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (62*b
*d^2*n - 30*a*d^2 - 9*(2*b*e^2*n - 5*a*e^2)*x^2 - (16*b*d*e*n - 15*a*d*e)*x
 + 15*(3*b*e^2*x^2 + b*d*e*x - 2*b*d^2)*log(c) + 15*(3*b*e^2*n*x^2 + b*d*e*
n*x - 2*b*d^2*n)*log(x))*sqrt(e*x + d))/e^2, 2/225*(60*b*sqrt(-d)*d^2*n*arc
tan(sqrt(e*x + d)*sqrt(-d)/d) + (62*b*d^2*n - 30*a*d^2 - 9*(2*b*e^2*n - 5*a
*e^2)*x^2 - (16*b*d*e*n - 15*a*d*e)*x + 15*(3*b*e^2*x^2 + b*d*e*x - 2*b*d^2
)*log(c) + 15*(3*b*e^2*n*x^2 + b*d*e*n*x - 2*b*d^2*n)*log(x))*sqrt(e*x + d)
)/e^2]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{ex+d}\left(b\log\left(cx^n\right)+a\right)x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)*x, x)
```

maple [F] time = 0.46, size = 0, normalized size = 0.00

$$\int\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{ex+d}\;x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)*(e*x+d)^(1/2),x)
```

```
[Out] int(x*(b*ln(c*x^n)+a)*(e*x+d)^(1/2),x)
```

maxima [A] time = 1.58, size = 143, normalized size = 1.01

$$\frac{4}{225}\left(\frac{15\,d^{\frac{5}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^2}-\frac{9\,(ex+d)^{\frac{5}{2}}-10\,(ex+d)^{\frac{3}{2}}d-30\,\sqrt{ex+d}\,d\,d^2}{e^2}\right)bn+\frac{2}{15}\,b\left(\frac{3\,(ex+d)^{\frac{5}{2}}}{e^2}-\frac{5\,(ex+d)^{\frac{3}{2}}}{e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 4/225*(15*d^(5/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d)))/
e^2 - (9*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d - 30*sqrt(e*x + d)*d^2)/e^2
)*b*n + 2/15*b*(3*(e*x + d)^(5/2)/e^2 - 5*(e*x + d)^(3/2)*d/e^2)*log(c*x^n)
 + 2/15*a*(3*(e*x + d)^(5/2)/e^2 - 5*(e*x + d)^(3/2)*d/e^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,\sqrt{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*log(c*x^n))*(d + e*x)^(1/2),x)
```

```
[Out] int(x*(a + b*log(c*x^n))*(d + e*x)^(1/2), x)
```

sympy [A] time = 6.86, size = 224, normalized size = 1.58

$$\frac{2\left(-\frac{ad(d+ex)^{\frac{3}{2}}}{3}+\frac{a(d+ex)^{\frac{5}{2}}}{5}-bd\left(\frac{(d+ex)^{\frac{3}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^{n}\right)}{3}-\frac{2n\left(\frac{d^{2}e\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}+de\sqrt{d+ex}+\frac{e(d+ex)^{\frac{3}{2}}}{3}\right)}{3e}\right)+b\left(\frac{(d+ex)^{\frac{5}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right.\right.}{5}\right.\right.}{e^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))*(e*x+d)**(1/2),x)
```

```
[Out] 2*(-a*d*(d + e*x)**(3/2)/3 + a*(d + e*x)**(5/2)/5 - b*d*((d + e*x)**(3/2)*l
og(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/
sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)) + b*((d + e*x)*
*(5/2)*log(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*x)/sq
rt(-d))/sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(d + e
*x)**(5/2)/5)/(5*e)))/e**2
```

3.133 $\int \sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=94

$$\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e}+\frac{4bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e}-\frac{4bdn\sqrt{d+ex}}{3e}-\frac{4bn(d+ex)^{3/2}}{9e}$$

```
[Out] -4/9*b*n*(e*x+d)^(3/2)/e+4/3*b*d^(3/2)*n*arctanh((e*x+d)^(1/2)/d^(1/2))/e+2
/3*(e*x+d)^(3/2)*(a+b*ln(c*x^n))/e-4/3*b*d*n*(e*x+d)^(1/2)/e
```

Rubi [A] time = 0.04, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2319, 50, 63, 208}

$$\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e}+\frac{4bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e}-\frac{4bdn\sqrt{d+ex}}{3e}-\frac{4bn(d+ex)^{3/2}}{9e}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-4*b*d*n*Sqrt[d + e*x])/(3*e) - (4*b*n*(d + e*x)^(3/2))/(9*e) + (4*b*d^(3/
2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(3*e) + (2*(d + e*x)^(3/2)*(a + b*Log[
c*x^n]))/(3*e)
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rubi steps

$$\int \sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)dx = \frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e} - \frac{(2bn)\int\frac{(d+ex)^{3/2}}{x}dx}{3e}$$
$$= -\frac{4bn(d+ex)^{3/2}}{9e} + \frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e} - \frac{(2bdn)\int\frac{\sqrt{d+ex}}{x}dx}{3e}$$
$$= -\frac{4bdn\sqrt{d+ex}}{3e} - \frac{4bn(d+ex)^{3/2}}{9e} + \frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e} - \frac{\left(2bd^2n\right)\int}{3}$$
$$= -\frac{4bdn\sqrt{d+ex}}{3e} - \frac{4bn(d+ex)^{3/2}}{9e} + \frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e} - \frac{\left(4bd^2n\right)\mathrm{Su}}{}$$
$$= -\frac{4bdn\sqrt{d+ex}}{3e} - \frac{4bn(d+ex)^{3/2}}{9e} + \frac{4bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e} + \frac{2(d+ex)^{3/2}\left(a\right.}{3e}$$

Mathematica [A] time = 0.07, size = 77, normalized size = 0.82

$$\frac{2\left(\sqrt{d+ex}\left(3a(d+ex)+3b(d+ex)\log\left(cx^n\right)-2bn(4d+ex)\right)+6bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\right)}{9e}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*(6*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(3*a*(d +
e*x) - 2*b*n*(4*d + e*x) + 3*b*(d + e*x)*Log[c*x^n])))/(9*e)
```

fricas [A] time = 0.58, size = 184, normalized size = 1.96

$$\left[\frac{2\left(3\,bd^{\frac{3}{2}}n\log\left(\frac{ex+2\,\sqrt{ex+d}\,\sqrt{d}+2\,d}{x}\right)-\left(8\,bdn-3\,ad+(2\,ben-3\,ae)x-3\,(bex+bd)\log(c)-3\,(benx+bdn)\log(x)\right)\right.}{9\,e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/9*(3*b*d^(3/2)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - (8*b*d*n
 - 3*a*d + (2*b*e*n - 3*a*e)*x - 3*(b*e*x + b*d)*log(c) - 3*(b*e*n*x + b*d*
n)*log(x))*sqrt(e*x + d))/e, -2/9*(6*b*sqrt(-d)*d*n*arctan(sqrt(e*x + d)*sq
rt(-d)/d) + (8*b*d*n - 3*a*d + (2*b*e*n - 3*a*e)*x - 3*(b*e*x + b*d)*log(c)
 - 3*(b*e*n*x + b*d*n)*log(x))*sqrt(e*x + d))/e]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ex+d}\left(b\log\left(cx^n\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a), x)
```

maple [F] time = 0.46, size = 0, normalized size = 0.00

$$\int \left(b\ln\left(c\,x^n\right)+a\right)\sqrt{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)*(e*x+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)*(e*x+d)^(1/2),x)
```

maxima [A] time = 1.40, size = 93, normalized size = 0.99

$$\frac{2\,(ex+d)^{\frac{3}{2}}b\log\left(cx^{n}\right)}{3\,e}-\frac{2\left(3\,d^{\frac{3}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)+2\,(ex+d)^{\frac{3}{2}}+6\,\sqrt{ex+d}\,d\right)bn}{9\,e}+\frac{2\,(ex+d)^{\frac{3}{2}}a}{3\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 2/3*(e*x + d)^(3/2)*b*log(c*x^n)/e - 2/9*(3*d^(3/2)*log((sqrt(e*x + d) - sq
rt(d))/(sqrt(e*x + d) + sqrt(d))) + 2*(e*x + d)^(3/2) + 6*sqrt(e*x + d)*d)*
b*n/e + 2/3*(e*x + d)^(3/2)*a/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(a+b\,\ln\left(c\,x^n\right)\right)\,\sqrt{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))*(d + e*x)^(1/2),x)
```

```
[Out] int((a + b*log(c*x^n))*(d + e*x)^(1/2), x)
```

sympy [A] time = 3.79, size = 102, normalized size = 1.09

$$\frac{2\left(\frac{a(d+ex)^{\frac{3}{2}}}{3}+b\left(\frac{(d+ex)^{\frac{3}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^{n}\right)}{3}-\frac{2n\left(\frac{d^{2}e\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}+de\sqrt{d+ex}+\frac{e(d+ex)^{\frac{3}{2}}}{3}\right)}{3e}\right)\right)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x+d)**(1/2),x)
```

```
[Out] 2*(a*(d + e*x)**(3/2)/3 + b*((d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)**n
)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d + e*x)
 + e*(d + e*x)**(3/2)/3)/(3*e)))/e
```

3.134 $\int \frac{\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{x}\,dx$

Optimal. Leaf size=211

$$2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)-2\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)-2b\sqrt{d}\,n\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)-4bn\sqrt{d+$$

```
[Out] 4*b*n*arctanh((e*x+d)^(1/2)/d^(1/2))*d^(1/2)+2*b*n*arctanh((e*x+d)^(1/2)/d^
(1/2))^2*d^(1/2)-2*arctanh((e*x+d)^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*d^(1/2)-4
*b*n*arctanh((e*x+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))*d
^(1/2)-2*b*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))*d^(1/2)-4*b*n*(
e*x+d)^(1/2)+2*(a+b*ln(c*x^n))*(e*x+d)^(1/2)
```

Rubi [A] time = 0.33, antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {2346, 63, 208, 2348, 12, 5984, 5918, 2402, 2315, 2319, 50}

$$-2b\sqrt{d}\,n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)+2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)-2\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)-$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -4*b*n*Sqrt[d + e*x] + 4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*b*S
qrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2 + 2*Sqrt[d + e*x]*(a + b*Log[c*x^
n]) - 2*Sqrt[d]*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]) - 4*b*Sqr
t[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e
*x])] - 2*b*Sqrt[d]*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2346

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[((d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p)/x,
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x}\,dx = d\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex}}\,dx + e\int \frac{a+b\log(cx^n)}{\sqrt{d+ex}}\,dx$$

$$= 2\sqrt{d+ex}\,(a+b\log(cx^n)) - 2\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n)) - (2bn)$$

$$= -4bn\sqrt{d+ex} + 2\sqrt{d+ex}\,(a+b\log(cx^n)) - 2\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\,\mathrm{l}$$

$$= -4bn\sqrt{d+ex} + 2\sqrt{d+ex}\,(a+b\log(cx^n)) - 2\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\,\mathrm{l}$$

$$= -4bn\sqrt{d+ex} + 4b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2 + 2$$

$$= -4bn\sqrt{d+ex} + 4b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2 + 2$$

$$= -4bn\sqrt{d+ex} + 4b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2 + 2$$

$$= -4bn\sqrt{d+ex} + 4b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2 + 2$$

Mathematica [A] time = 0.22, size = 331, normalized size = 1.57

$$\sqrt{d}\log\left(\sqrt{d}-\sqrt{d+ex}\right)(a+b\log(cx^n)) - \sqrt{d}\log\left(\sqrt{d+ex}+\sqrt{d}\right)(a+b\log(cx^n)) + 2a\sqrt{d+ex} + 2b\sqrt{d+ex}\,\mathrm{lo}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] 2*a*Sqrt[d + e*x] - 4*b*n*(Sqrt[d + e*x] - Sqrt[d]*ArcTanh[Sqrt[d + e*x]/Sq
rt[d]]) + 2*b*Sqrt[d + e*x]*Log[c*x^n] + Sqrt[d]*(a + b*Log[c*x^n])*Log[Sqr
t[d] - Sqrt[d + e*x]] - Sqrt[d]*(a + b*Log[c*x^n])*Log[Sqrt[d] + Sqrt[d + e
*x]] - (b*Sqrt[d]*n*(Log[Sqrt[d] - Sqrt[d + e*x]]*(Log[Sqrt[d] - Sqrt[d + e
*x]] + 2*Log[(1 + Sqrt[d + e*x]/Sqrt[d])/2]) + 2*PolyLog[2, 1/2 - Sqrt[d +
e*x]/(2*Sqrt[d])]))/2 + (b*Sqrt[d]*n*(Log[Sqrt[d] + Sqrt[d + e*x]]*(Log[Sqr
t[d] + Sqrt[d + e*x]] + 2*Log[1/2 - Sqrt[d + e*x]/(2*Sqrt[d])]) + 2*PolyLog
[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2]))/2
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{ex+d}\,b\log(cx^n) + \sqrt{ex+d}\,a}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x,x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ex+d}\left(b\log\left(cx^n\right)+a\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)/x, x)
```

maple [F] time = 0.38, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{ex+d}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)*(e*x+d)^(1/2)/x,x)
```

```
[Out] int((b*ln(c*x^n)+a)*(e*x+d)^(1/2)/x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\left(\sqrt{d}\,\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)+2\sqrt{ex+d}\right)a+b\int \frac{\sqrt{ex+d}\left(\log(c)+\log\left(x^n\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] (sqrt(d)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d))) + 2*sqrt(
e*x + d))*a + b*integrate(sqrt(e*x + d)*(log(c) + log(x^n))/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\ln\left(c\,x^n\right)\right)\,\sqrt{d+e\,x}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^(1/2))/x,x)
```

```
[Out] int(((a + b*log(c*x^n))*(d + e*x)^(1/2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)\sqrt{d+ex}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x+d)**(1/2)/x,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x)/x, x)
```

3.135 $\int \frac{\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{x^2}\,dx$

Optimal. Leaf size=221

$$-\frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}-\frac{benLi_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{d}}-\frac{bn\sqrt{d+ex}}{x}+\frac{ben\tanh^{-1}\ldots}{\sqrt{\ldots}}$$

```
[Out] -b*e*n*arctanh((e*x+d)^(1/2)/d^(1/2))/d^(1/2)+b*e*n*arctanh((e*x+d)^(1/2)/d
^(1/2))^2/d^(1/2)-e*arctanh((e*x+d)^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/d^(1/2)-
2*b*e*n*arctanh((e*x+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2))
)/d^(1/2)-b*e*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))/d^(1/2)-b*n*
(e*x+d)^(1/2)/x-(a+b*ln(c*x^n))*(e*x+d)^(1/2)/x
```

Rubi [A] time = 0.28, antiderivative size = 221, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {47, 63, 208, 2350, 14, 5984, 5918, 2402, 2315}

$$-\frac{benPolyLog\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{d}}-\frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}-\frac{bn\sqrt{d+ex}}{x}+\ldots$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*n*Sqrt[d + e*x])/x) - (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/Sqrt[d] +
 (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/Sqrt[d] - (Sqrt[d + e*x]*(a + b*L
og[c*x^n]))/x - (e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/Sqrt[
d] - (2*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqr
t[d + e*x])])/Sqrt[d] - (b*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d
 + e*x])])/Sqrt[d]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] && !(IntegerQ[n] && !Intege
rQ[m]) && !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{x^2}dx = -\frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{x} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}} - (bn)\int \frac{-\sqrt{}}{}$$

$$= -\frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{x} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}} - (bn)\int\Bigg(-$$

$$= -\frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{x} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}} + (bn)\int \frac{\sqrt{d}}{}$$

$$= -\frac{bn\sqrt{d+ex}}{x} - \frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{x} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}$$

$$= -\frac{bn\sqrt{d+ex}}{x} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{x} - \frac{e\tanh^{-1}\left(\right.}{}$$

$$= -\frac{bn\sqrt{d+ex}}{x} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{\sqrt{d+ex}\,(a+b}{x}$$

$$= -\frac{bn\sqrt{d+ex}}{x} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{\sqrt{d+ex}\,(a+b}{x}$$

$$= -\frac{bn\sqrt{d+ex}}{x} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{\sqrt{d+ex}\,(a+b}{x}$$

Mathematica [A] time = 0.34, size = 392, normalized size = 1.77

$$-\frac{4a\sqrt{d}\sqrt{d+ex} - 2aex\log\left(\sqrt{d}-\sqrt{d+ex}\right) + 2aex\log\left(\sqrt{d+ex}+\sqrt{d}\right) - 2bex\log\left(cx^n\right)\log\left(\sqrt{d}-\sqrt{d+ex}\right) +}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -1/4*(4*a*Sqrt[d]*Sqrt[d + e*x] + 4*b*Sqrt[d]*n*Sqrt[d + e*x] + 4*b*e*n*x*A
rcTanh[Sqrt[d + e*x]/Sqrt[d]] + 4*b*Sqrt[d]*Sqrt[d + e*x]*Log[c*x^n] - 2*a*
e*x*Log[Sqrt[d] - Sqrt[d + e*x]] - 2*b*e*x*Log[c*x^n]*Log[Sqrt[d] - Sqrt[d
+ e*x]] + b*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]^2 + 2*a*e*x*Log[Sqrt[d] + Sq
rt[d + e*x]] + 2*b*e*x*Log[c*x^n]*Log[Sqrt[d] + Sqrt[d + e*x]] - b*e*n*x*Lo
g[Sqrt[d] + Sqrt[d + e*x]]^2 - 2*b*e*n*x*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1
/2 - Sqrt[d + e*x]/(2*Sqrt[d])] + 2*b*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]*Lo
g[(1 + Sqrt[d + e*x]/Sqrt[d])/2] + 2*b*e*n*x*PolyLog[2, 1/2 - Sqrt[d + e*x]
/(2*Sqrt[d])] - 2*b*e*n*x*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2])/(Sqrt[
d]*x)
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex+d}\,b\log\left(cx^n\right)+\sqrt{ex+d}\,a}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^2,x, algorithm="fricas")
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ex+d}\left(b\log\left(cx^n\right)+a\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^2,x, algorithm="giac")
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)/x^2, x)
```

maple [F] time = 0.40, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{ex+d}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)*(e*x+d)^(1/2)/x^2,x)
[Out] int((b*ln(c*x^n)+a)*(e*x+d)^(1/2)/x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\left(\frac{e\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{\sqrt{d}}-\frac{2\sqrt{ex+d}}{x}\right)a+b\int \frac{\sqrt{ex+d}\left(\log(c)+\log\left(x^n\right)\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^2,x, algorithm="maxima")
[Out] 1/2*(e*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d)))/sqrt(d) - 2
*sqrt(e*x + d)/x)*a + b*integrate(sqrt(e*x + d)*(log(c) + log(x^n))/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\ln\left(c\,x^n\right)\right)\,\sqrt{d+e\,x}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^(1/2))/x^2,x)
[Out] int(((a + b*log(c*x^n))*(d + e*x)^(1/2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)\sqrt{d+ex}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x+d)**(1/2)/x**2,x)
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x)/x**2, x)
```

3.136 $\int \frac{\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{x^3}\,dx$

Optimal. Leaf size=298

$$\frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{4d^{3/2}}-\frac{e\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{4dx}-\frac{\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2}+\frac{be^2n\mathrm{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d}}\right.}{4d^{3/2}}$$

```
[Out] -1/8*b*e^2*n*arctanh((e*x+d)^(1/2)/d^(1/2))/d^(3/2)-1/4*b*e^2*n*arctanh((e*
x+d)^(1/2)/d^(1/2))^2/d^(3/2)+1/4*e^2*arctanh((e*x+d)^(1/2)/d^(1/2))*(a+b*l
n(c*x^n))/d^(3/2)+1/2*b*e^2*n*arctanh((e*x+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(
d^(1/2)-(e*x+d)^(1/2)))/d^(3/2)+1/4*b*e^2*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-
(e*x+d)^(1/2)))/d^(3/2)-1/4*b*n*(e*x+d)^(1/2)/x^2-3/8*b*e*n*(e*x+d)^(1/2)/d
/x-1/2*(a+b*ln(c*x^n))*(e*x+d)^(1/2)/x^2-1/4*e*(a+b*ln(c*x^n))*(e*x+d)^(1/2
)/d/x
```

Rubi [A] time = 0.34, antiderivative size = 298, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {47, 51, 63, 208, 2350, 12, 14, 5984, 5918, 2402, 2315}

$$\frac{be^2n\mathrm{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{4d^{3/2}}+\frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{4d^{3/2}}-\frac{e\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{4dx}-\frac{\sqrt{d+ex}\,\left(a+\right.}{2x}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*n*Sqrt[d + e*x])/(4*x^2) - (3*b*e*n*Sqrt[d + e*x])/(8*d*x) - (b*e^2*n*A
rcTanh[Sqrt[d + e*x]/Sqrt[d]])/(8*d^(3/2)) - (b*e^2*n*ArcTanh[Sqrt[d + e*x]
/Sqrt[d]]^2)/(4*d^(3/2)) - (Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(2*x^2) - (e*
Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(4*d*x) + (e^2*ArcTanh[Sqrt[d + e*x]/Sqrt
[d]]*(a + b*Log[c*x^n]))/(4*d^(3/2)) + (b*e^2*n*ArcTanh[Sqrt[d + e*x]/Sqrt[
d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(2*d^(3/2)) + (b*e^2*n*Poly
Log[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(4*d^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
```

```
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx = -\frac{\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{4dx} + \frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4d^3}$$

$$= -\frac{\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{4dx} + \frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4d^3}$$

$$= -\frac{\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{4dx} + \frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4d^3}$$

$$= -\frac{\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{4dx} + \frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4d^3}$$

$$= -\frac{bn\sqrt{d+ex}}{4x^2} - \frac{ben\sqrt{d+ex}}{4dx} - \frac{\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\sqrt{d+ex}\,\left(a+b\log\right.}{4dx}$$

$$= -\frac{bn\sqrt{d+ex}}{4x^2} - \frac{3ben\sqrt{d+ex}}{8dx} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \frac{\sqrt{d+ex}\,\left(a+b\log\left(c\right.\right.}{2x^2}$$

$$= -\frac{bn\sqrt{d+ex}}{4x^2} - \frac{3ben\sqrt{d+ex}}{8dx} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4d^{3/2}} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{3/2}}$$

$$= -\frac{bn\sqrt{d+ex}}{4x^2} - \frac{3ben\sqrt{d+ex}}{8dx} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8d^{3/2}} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{3/2}}$$

$$= -\frac{bn\sqrt{d+ex}}{4x^2} - \frac{3ben\sqrt{d+ex}}{8dx} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8d^{3/2}} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{3/2}}$$

Mathematica [A] time = 0.55, size = 500, normalized size = 1.68

$$-\frac{8ad^{3/2}\sqrt{d+ex} + 2ae^2x^2\log\left(\sqrt{d}-\sqrt{d+ex}\right) - 2ae^2x^2\log\left(\sqrt{d+ex}+\sqrt{d}\right) + 4a\sqrt{d}\,ex\sqrt{d+ex} + 8bd^{3/2}\sqrt{d+e}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -1/16*(8*a*d^(3/2)*Sqrt[d + e*x] + 4*b*d^(3/2)*n*Sqrt[d + e*x] + 4*a*Sqrt[d
]*e*x*Sqrt[d + e*x] + 6*b*Sqrt[d]*e*n*x*Sqrt[d + e*x] + 2*b*e^2*n*x^2*ArcTa
nh[Sqrt[d + e*x]/Sqrt[d]] + 8*b*d^(3/2)*Sqrt[d + e*x]*Log[c*x^n] + 4*b*Sqrt
[d]*e*x*Sqrt[d + e*x]*Log[c*x^n] + 2*a*e^2*x^2*Log[Sqrt[d] - Sqrt[d + e*x]]
 + 2*b*e^2*x^2*Log[c*x^n]*Log[Sqrt[d] - Sqrt[d + e*x]] - b*e^2*n*x^2*Log[Sq
rt[d] - Sqrt[d + e*x]]^2 - 2*a*e^2*x^2*Log[Sqrt[d] + Sqrt[d + e*x]] - 2*b*e
^2*x^2*Log[c*x^n]*Log[Sqrt[d] + Sqrt[d + e*x]] + b*e^2*n*x^2*Log[Sqrt[d] +
Sqrt[d + e*x]]^2 + 2*b*e^2*n*x^2*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1/2 - Sqr
t[d + e*x]/(2*Sqrt[d])] - 2*b*e^2*n*x^2*Log[Sqrt[d] - Sqrt[d + e*x]]*Log[(1
```

```
 + Sqrt[d + e*x]/Sqrt[d])/2] - 2*b*e^2*n*x^2*PolyLog[2, 1/2 - Sqrt[d + e*x]
/(2*Sqrt[d])] + 2*b*e^2*n*x^2*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2])/(d
^(3/2)*x^2)
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex+d}\,b\log\left(cx^n\right)+\sqrt{ex+d}\,a}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^3,x, algorithm="fricas")
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ex+d}\left(b\log\left(cx^n\right)+a\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^3,x, algorithm="giac")
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)/x^3, x)
```

maple [F] time = 0.39, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{ex+d}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)*(e*x+d)^(1/2)/x^3,x)
[Out] int((b*ln(c*x^n)+a)*(e*x+d)^(1/2)/x^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{8}\left(\frac{e^2\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{d^{\frac{3}{2}}}+\frac{2\left((ex+d)^{\frac{3}{2}}e^2+\sqrt{ex+d}\,de^2\right)}{(ex+d)^2d-2\,(ex+d)d^2+d^3}\right)a+b\int\frac{\sqrt{ex+d}\left(\log(c)+\log\left(x^n\right)\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^3,x, algorithm="maxima")
[Out] -1/8*(e^2*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d)))/d^(3/2)
+ 2*((e*x + d)^(3/2)*e^2 + sqrt(e*x + d)*d*e^2)/((e*x + d)^2*d - 2*(e*x + d
)*d^2 + d^3))*a + b*integrate(sqrt(e*x + d)*(log(c) + log(x^n))/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\ln\left(c\,x^n\right)\right)\,\sqrt{d+e\,x}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^(1/2))/x^3,x)
[Out] int(((a + b*log(c*x^n))*(d + e*x)^(1/2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^{n}\right)\right)\sqrt{d+ex}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x+d)**(1/2)/x**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x)/x**3, x)
```

3.137 $\int x^3(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=263

$$-\frac{2d^3(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}+\frac{6d^2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^4}-\frac{2d(d+ex)^{9/2}\left(a+b\log\left(cx^n\right)\right)}{3e^4}+\frac{2(d+ex)^{11}}{}$$

```
[Out] 64/3465*b*d^4*n*(e*x+d)^(3/2)/e^4+64/5775*b*d^3*n*(e*x+d)^(5/2)/e^4-172/161
7*b*d^2*n*(e*x+d)^(7/2)/e^4+32/297*b*d*n*(e*x+d)^(9/2)/e^4-4/121*b*n*(e*x+d
)^(11/2)/e^4-64/1155*b*d^(11/2)*n*arctanh((e*x+d)^(1/2)/d^(1/2))/e^4-2/5*d^
3*(e*x+d)^(5/2)*(a+b*ln(c*x^n))/e^4+6/7*d^2*(e*x+d)^(7/2)*(a+b*ln(c*x^n))/e
^4-2/3*d*(e*x+d)^(9/2)*(a+b*ln(c*x^n))/e^4+2/11*(e*x+d)^(11/2)*(a+b*ln(c*x^
n))/e^4+64/1155*b*d^5*n*(e*x+d)^(1/2)/e^4
```

Rubi [A] time = 0.24, antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {43, 2350, 12, 1620, 50, 63, 208}

$$-\frac{2d^3(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}+\frac{6d^2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^4}-\frac{2d(d+ex)^{9/2}\left(a+b\log\left(cx^n\right)\right)}{3e^4}+\frac{2(d+ex)^{11}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (64*b*d^5*n*Sqrt[d + e*x])/(1155*e^4) + (64*b*d^4*n*(d + e*x)^(3/2))/(3465*
e^4) + (64*b*d^3*n*(d + e*x)^(5/2))/(5775*e^4) - (172*b*d^2*n*(d + e*x)^(7/
2))/(1617*e^4) + (32*b*d*n*(d + e*x)^(9/2))/(297*e^4) - (4*b*n*(d + e*x)^(1
1/2))/(121*e^4) - (64*b*d^(11/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(1155*e^
4) - (2*d^3*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4) + (6*d^2*(d + e*x)^
(7/2)*(a + b*Log[c*x^n]))/(7*e^4) - (2*d*(d + e*x)^(9/2)*(a + b*Log[c*x^n])
)/(3*e^4) + (2*(d + e*x)^(11/2)*(a + b*Log[c*x^n]))/(11*e^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
```

```
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int x^3(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)dx = -\frac{2d^3(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}+\frac{6d^2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^4}-\frac{2d(d$$

$$= -\frac{2d^3(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}+\frac{6d^2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^4}-\frac{2d(d$$

$$= -\frac{2d^3(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}+\frac{6d^2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^4}-\frac{2d(d$$

$$= -\frac{172bd^2n(d+ex)^{7/2}}{1617e^4}+\frac{32bdn(d+ex)^{9/2}}{297e^4}-\frac{4bn(d+ex)^{11/2}}{121e^4}-\frac{2d^3(d+ex)^{5}}{}$$

$$= \frac{64bd^3n(d+ex)^{5/2}}{5775e^4}-\frac{172bd^2n(d+ex)^{7/2}}{1617e^4}+\frac{32bdn(d+ex)^{9/2}}{297e^4}-\frac{4bn(d+ex)}{121e^4}$$

$$= \frac{64bd^4n(d+ex)^{3/2}}{3465e^4}+\frac{64bd^3n(d+ex)^{5/2}}{5775e^4}-\frac{172bd^2n(d+ex)^{7/2}}{1617e^4}+\frac{32bdn(d+}{297e}$$

$$= \frac{64bd^5n\sqrt{d+ex}}{1155e^4}+\frac{64bd^4n(d+ex)^{3/2}}{3465e^4}+\frac{64bd^3n(d+ex)^{5/2}}{5775e^4}-\frac{172bd^2n(d+}{1617e^4}$$

$$= \frac{64bd^5n\sqrt{d+ex}}{1155e^4}+\frac{64bd^4n(d+ex)^{3/2}}{3465e^4}+\frac{64bd^3n(d+ex)^{5/2}}{5775e^4}-\frac{172bd^2n(d+}{1617e^4}$$

$$= \frac{64bd^5n\sqrt{d+ex}}{1155e^4}+\frac{64bd^4n(d+ex)^{3/2}}{3465e^4}+\frac{64bd^3n(d+ex)^{5/2}}{5775e^4}-\frac{172bd^2n(d+}{1617e^4}$$

Mathematica [A] time = 0.34, size = 187, normalized size = 0.71

$$2\sqrt{d+ex}\left(-3465a\left(16d^3-40d^2ex+70de^2x^2-105e^3x^3\right)(d+ex)^2-3465b\left(16d^3-40d^2ex+70de^2x^2-105e^3x^3\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-221760*b*d^(11/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*Sqrt[d + e*x]*(-34
65*a*(d + e*x)^2*(16*d^3 - 40*d^2*e*x + 70*d*e^2*x^2 - 105*e^3*x^3) + 2*b*n
*(53308*d^5 - 12794*d^4*e*x + 7863*d^3*e^2*x^2 - 5975*d^2*e^3*x^3 - 57575*d
*e^4*x^4 - 33075*e^5*x^5) - 3465*b*(d + e*x)^2*(16*d^3 - 40*d^2*e*x + 70*d*
e^2*x^2 - 105*e^3*x^3)*Log[c*x^n]))/(4002075*e^4)
```

fricas [A] time = 0.70, size = 595, normalized size = 2.26

$$\left[\frac{2\left(55440\,bd^{\frac{11}{2}}n\log\left(\frac{ex-2\sqrt{ex+d}\sqrt{d}+2d}{x}\right)+\left(106616\,bd^{5}n-55440\,ad^{5}-33075\left(2\,be^{5}n-11\,ae^{5}\right)x^{5}-2450\left(47\,bd\cdots\right.\right.\right.}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [2/4002075*(55440*b*d^(11/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x)
 + (106616*b*d^5*n - 55440*a*d^5 - 33075*(2*b*e^5*n - 11*a*e^5)*x^5 - 2450*
(47*b*d*e^4*n - 198*a*d*e^4)*x^4 - 25*(478*b*d^2*e^3*n - 693*a*d^2*e^3)*x^3
 + 6*(2621*b*d^3*e^2*n - 3465*a*d^3*e^2)*x^2 - 4*(6397*b*d^4*e*n - 6930*a*d
^4*e)*x + 3465*(105*b*e^5*x^5 + 140*b*d*e^4*x^4 + 5*b*d^2*e^3*x^3 - 6*b*d^3
*e^2*x^2 + 8*b*d^4*e*x - 16*b*d^5)*log(c) + 3465*(105*b*e^5*n*x^5 + 140*b*d
*e^4*n*x^4 + 5*b*d^2*e^3*n*x^3 - 6*b*d^3*e^2*n*x^2 + 8*b*d^4*e*n*x - 16*b*d
^5*n)*log(x))*sqrt(e*x + d))/e^4, 2/4002075*(110880*b*sqrt(-d)*d^5*n*arctan
(sqrt(e*x + d)*sqrt(-d)/d) + (106616*b*d^5*n - 55440*a*d^5 - 33075*(2*b*e^5
*n - 11*a*e^5)*x^5 - 2450*(47*b*d*e^4*n - 198*a*d*e^4)*x^4 - 25*(478*b*d^2*
e^3*n - 693*a*d^2*e^3)*x^3 + 6*(2621*b*d^3*e^2*n - 3465*a*d^3*e^2)*x^2 - 4*
(6397*b*d^4*e*n - 6930*a*d^4*e)*x + 3465*(105*b*e^5*x^5 + 140*b*d*e^4*x^4 +
 5*b*d^2*e^3*x^3 - 6*b*d^3*e^2*x^2 + 8*b*d^4*e*x - 16*b*d^5)*log(c) + 3465*
(105*b*e^5*n*x^5 + 140*b*d*e^4*n*x^4 + 5*b*d^2*e^3*n*x^3 - 6*b*d^3*e^2*n*x^
2 + 8*b*d^4*e*n*x - 16*b*d^5*n)*log(x))*sqrt(e*x + d))/e^4]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex+d)^{\frac{3}{2}}\left(b\log\left(cx^{n}\right)+a\right)x^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)*x^3, x)
```

maple [F] time = 0.47, size = 0, normalized size = 0.00

$$\int (ex+d)^{\frac{3}{2}}\left(b\ln\left(c\,x^{n}\right)+a\right)x^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

```
[Out] int(x^3*(e*x+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

maxima [A] time = 1.33, size = 239, normalized size = 0.91

$$\frac{4}{4002075}\left(\frac{27720\,d^{\frac{11}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^{4}}-\frac{33075\,(ex+d)^{\frac{11}{2}}-107800\,(ex+d)^{\frac{9}{2}}d+106425\,(ex+d)^{\frac{7}{2}}d^{2}-11088\,(\cdots}{e^{4}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] 4/4002075*(27720*d^(11/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sq
rt(d)))/e^4 - (33075*(e*x + d)^(11/2) - 107800*(e*x + d)^(9/2)*d + 106425*(
e*x + d)^(7/2)*d^2 - 11088*(e*x + d)^(5/2)*d^3 - 18480*(e*x + d)^(3/2)*d^4
- 55440*sqrt(e*x + d)*d^5)/e^4)*b*n + 2/1155*(105*(e*x + d)^(11/2)/e^4 - 38
5*(e*x + d)^(9/2)*d/e^4 + 495*(e*x + d)^(7/2)*d^2/e^4 - 231*(e*x + d)^(5/2)
*d^3/e^4)*b*log(c*x^n) + 2/1155*(105*(e*x + d)^(11/2)/e^4 - 385*(e*x + d)^(
9/2)*d/e^4 + 495*(e*x + d)^(7/2)*d^2/e^4 - 231*(e*x + d)^(5/2)*d^3/e^4)*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,{\left(d+e\,x\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*log(c*x^n))*(d + e*x)^(3/2),x)
```

```
[Out] int(x^3*(a + b*log(c*x^n))*(d + e*x)^(3/2), x)
```

sympy [B] time = 148.74, size = 1188, normalized size = 4.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] 2*a*d*(-d**3*(d + e*x)**(3/2)/3 + 3*d**2*(d + e*x)**(5/2)/5 - 3*d*(d + e*x)
**(7/2)/7 + (d + e*x)**(9/2)/9)/e**4 + 2*a*(d**4*(d + e*x)**(3/2)/3 - 4*d**
3*(d + e*x)**(5/2)/5 + 6*d**2*(d + e*x)**(7/2)/7 - 4*d*(d + e*x)**(9/2)/9 +
 (d + e*x)**(11/2)/11)/e**4 + 2*b*d*(-d**3*((d + e*x)**(3/2)*log(c*(-d/e +
(d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*
e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)) + 3*d**2*((d + e*x)**(5/2)*l
og(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*x)/sqrt(-d))/
sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(d + e*x)**(5/
2)/5)/(5*e)) - 3*d*((d + e*x)**(7/2)*log(c*(-d/e + (d + e*x)/e)**n)/7 - 2*n
*(d**4*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**3*e*sqrt(d + e*x) + d**
2*e*(d + e*x)**(3/2)/3 + d*e*(d + e*x)**(5/2)/5 + e*(d + e*x)**(7/2)/7)/(7*
e)) + (d + e*x)**(9/2)*log(c*(-d/e + (d + e*x)/e)**n)/9 - 2*n*(d**5*e*atan(
sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**4*e*sqrt(d + e*x) + d**3*e*(d + e*x)*
*(3/2)/3 + d**2*e*(d + e*x)**(5/2)/5 + d*e*(d + e*x)**(7/2)/7 + e*(d + e*x)
**(9/2)/9)/(9*e))/e**4 + 2*b*(d**4*((d + e*x)**(3/2)*log(c*(-d/e + (d + e*x
)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d
 + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)) - 4*d**3*((d + e*x)**(5/2)*log(c*(-d
/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d)
 + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(d + e*x)**(5/2)/5)/(5
*e)) + 6*d**2*((d + e*x)**(7/2)*log(c*(-d/e + (d + e*x)/e)**n)/7 - 2*n*(d**
4*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**3*e*sqrt(d + e*x) + d**2*e*(
d + e*x)**(3/2)/3 + d*e*(d + e*x)**(5/2)/5 + e*(d + e*x)**(7/2)/7)/(7*e)) -
 4*d*((d + e*x)**(9/2)*log(c*(-d/e + (d + e*x)/e)**n)/9 - 2*n*(d**5*e*atan(
sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**4*e*sqrt(d + e*x) + d**3*e*(d + e*x)*
*(3/2)/3 + d**2*e*(d + e*x)**(5/2)/5 + d*e*(d + e*x)**(7/2)/7 + e*(d + e*x)
**(9/2)/9)/(9*e)) + (d + e*x)**(11/2)*log(c*(-d/e + (d + e*x)/e)**n)/11 - 2
*n*(d**6*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**5*e*sqrt(d + e*x) + d
**4*e*(d + e*x)**(3/2)/3 + d**3*e*(d + e*x)**(5/2)/5 + d**2*e*(d + e*x)**(7
/2)/7 + d*e*(d + e*x)**(9/2)/9 + e*(d + e*x)**(11/2)/11)/(11*e))/e**4
```

3.138 $\int x^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=213

$$\frac{2d^2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3}-\frac{4d(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3}+\frac{2(d+ex)^{9/2}\left(a+b\log\left(cx^n\right)\right)}{9e^3}+\frac{32bd^{9/2}n\tanh}{315e}$$

```
[Out] -32/945*b*d^3*n*(e*x+d)^(3/2)/e^3-32/1575*b*d^2*n*(e*x+d)^(5/2)/e^3+44/441*
b*d*n*(e*x+d)^(7/2)/e^3-4/81*b*n*(e*x+d)^(9/2)/e^3+32/315*b*d^(9/2)*n*arcta
nh((e*x+d)^(1/2)/d^(1/2))/e^3+2/5*d^2*(e*x+d)^(5/2)*(a+b*ln(c*x^n))/e^3-4/7
*d*(e*x+d)^(7/2)*(a+b*ln(c*x^n))/e^3+2/9*(e*x+d)^(9/2)*(a+b*ln(c*x^n))/e^3-
32/315*b*d^4*n*(e*x+d)^(1/2)/e^3
```

Rubi [A] time = 0.20, antiderivative size = 213, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {43, 2350, 12, 897, 1261, 208}

$$\frac{2d^2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3}-\frac{4d(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3}+\frac{2(d+ex)^{9/2}\left(a+b\log\left(cx^n\right)\right)}{9e^3}-\frac{32bd^4n\sqrt{d+e}}{315e^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-32*b*d^4*n*Sqrt[d + e*x])/(315*e^3) - (32*b*d^3*n*(d + e*x)^(3/2))/(945*e
^3) - (32*b*d^2*n*(d + e*x)^(5/2))/(1575*e^3) + (44*b*d*n*(d + e*x)^(7/2))/
(441*e^3) - (4*b*n*(d + e*x)^(9/2))/(81*e^3) + (32*b*d^(9/2)*n*ArcTanh[Sqrt
[d + e*x]/Sqrt[d]])/(315*e^3) + (2*d^2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/
(5*e^3) - (4*d*(d + e*x)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3) + (2*(d + e*x)^(
9/2)*(a + b*Log[c*x^n]))/(9*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int x^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)dx = \frac{2d^2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} - \frac{4d(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3} + \frac{2(d+e\cdots}{\cdots}$$

$$= \frac{2d^2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} - \frac{4d(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3} + \frac{2(d+e\cdots}{\cdots}$$

$$= \frac{2d^2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} - \frac{4d(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3} + \frac{2(d+e\cdots}{\cdots}$$

$$= \frac{2d^2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} - \frac{4d(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3} + \frac{2(d+e\cdots}{\cdots}$$

$$= -\frac{32bd^4n\sqrt{d+ex}}{315e^3} - \frac{32bd^3n(d+ex)^{3/2}}{945e^3} - \frac{32bd^2n(d+ex)^{5/2}}{1575e^3} + \frac{44bdn(d+e\cdots}{441e^3}$$

$$= -\frac{32bd^4n\sqrt{d+ex}}{315e^3} - \frac{32bd^3n(d+ex)^{3/2}}{945e^3} - \frac{32bd^2n(d+ex)^{5/2}}{1575e^3} + \frac{44bdn(d+e\cdots}{441e^3}$$

Mathematica [A] time = 0.24, size = 153, normalized size = 0.72

$$\frac{2\left(\sqrt{d+ex}\left(315a\left(8d^2-20dex+35e^2x^2\right)(d+ex)^2+315b\left(8d^2-20dex+35e^2x^2\right)(d+ex)^2\log\left(cx^n\right)-2bn\left(261\cdots\right.\right.\right.}{99225e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*(5040*b*d^(9/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(315*a*
(d + e*x)^2*(8*d^2 - 20*d*e*x + 35*e^2*x^2) - 2*b*n*(2614*d^4 - 677*d^3*e*x
 + 429*d^2*e^2*x^2 + 2425*d*e^3*x^3 + 1225*e^4*x^4) + 315*b*(d + e*x)^2*(8*
d^2 - 20*d*e*x + 35*e^2*x^2)*Log[c*x^n])))/(99225*e^3)
```

fricas [A] time = 0.80, size = 496, normalized size = 2.33

$$\left[\frac{2\left(2520\,bd^{\frac{9}{2}}n\log\left(\frac{ex+2\,\sqrt{ex+d}\,\sqrt{d}+2\,d}{x}\right)-\left(5228\,bd^4n-2520\,ad^4+1225\left(2\,be^4n-9\,ae^4\right)x^4+50\left(97\,bde^3n-315\,ad\cdots\right.\right.\right.}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [2/99225*(2520*b*d^(9/2)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - (
5228*b*d^4*n - 2520*a*d^4 + 1225*(2*b*e^4*n - 9*a*e^4)*x^4 + 50*(97*b*d*e^3
*n - 315*a*d*e^3)*x^3 + 3*(286*b*d^2*e^2*n - 315*a*d^2*e^2)*x^2 - 2*(677*b*
d^3*e*n - 630*a*d^3*e)*x - 315*(35*b*e^4*x^4 + 50*b*d*e^3*x^3 + 3*b*d^2*e^2
*x^2 - 4*b*d^3*e*x + 8*b*d^4)*log(c) - 315*(35*b*e^4*n*x^4 + 50*b*d*e^3*n*x
^3 + 3*b*d^2*e^2*n*x^2 - 4*b*d^3*e*n*x + 8*b*d^4*n)*log(x))*sqrt(e*x + d))/
e^3, -2/99225*(5040*b*sqrt(-d)*d^4*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (52
28*b*d^4*n - 2520*a*d^4 + 1225*(2*b*e^4*n - 9*a*e^4)*x^4 + 50*(97*b*d*e^3*n
 - 315*a*d*e^3)*x^3 + 3*(286*b*d^2*e^2*n - 315*a*d^2*e^2)*x^2 - 2*(677*b*d^
3*e*n - 630*a*d^3*e)*x - 315*(35*b*e^4*x^4 + 50*b*d*e^3*x^3 + 3*b*d^2*e^2*x
^2 - 4*b*d^3*e*x + 8*b*d^4)*log(c) - 315*(35*b*e^4*n*x^4 + 50*b*d*e^3*n*x^3
 + 3*b*d^2*e^2*n*x^2 - 4*b*d^3*e*n*x + 8*b*d^4*n)*log(x))*sqrt(e*x + d))/e^
3]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex+d)^{\frac{3}{2}}\left(b\log\left(cx^{n}\right)+a\right)x^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)*x^2, x)
```

maple [F] time = 0.45, size = 0, normalized size = 0.00

$$\int (ex+d)^{\frac{3}{2}}\left(b\ln\left(c\,x^{n}\right)+a\right)x^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

```
[Out] int(x^2*(e*x+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

maxima [A] time = 1.53, size = 196, normalized size = 0.92

$$-\frac{4}{99225}\left(\frac{1260\,d^{\frac{9}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^{3}}+\frac{1225\,(ex+d)^{\frac{9}{2}}-2475\,(ex+d)^{\frac{7}{2}}d+504\,(ex+d)^{\frac{5}{2}}d^{2}+840\,(ex+d)^{\frac{3}{2}}d^{3}+}{e^{3}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -4/99225*(1260*d^(9/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(
d)))/e^3 + (1225*(e*x + d)^(9/2) - 2475*(e*x + d)^(7/2)*d + 504*(e*x + d)^(
5/2)*d^2 + 840*(e*x + d)^(3/2)*d^3 + 2520*sqrt(e*x + d)*d^4)/e^3)*b*n + 2/3
15*(35*(e*x + d)^(9/2)/e^3 - 90*(e*x + d)^(7/2)*d/e^3 + 63*(e*x + d)^(5/2)*
d^2/e^3)*b*log(c*x^n) + 2/315*(35*(e*x + d)^(9/2)/e^3 - 90*(e*x + d)^(7/2)*
d/e^3 + 63*(e*x + d)^(5/2)*d^2/e^3)*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,{\left(d+e\,x\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*log(c*x^n))*(d + e*x)^(3/2),x)
```

```
[Out] int(x^2*(a + b*log(c*x^n))*(d + e*x)^(3/2), x)
```

sympy [B] time = 105.83, size = 870, normalized size = 4.08

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] 2*a*d*(d**2*(d + e*x)**(3/2)/3 - 2*d*(d + e*x)**(5/2)/5 + (d + e*x)**(7/2)/
7)/e**3 + 2*a*(-d**3*(d + e*x)**(3/2)/3 + 3*d**2*(d + e*x)**(5/2)/5 - 3*d*(
d + e*x)**(7/2)/7 + (d + e*x)**(9/2)/9)/e**3 + 2*b*d*(d**2*((d + e*x)**(3/2
)*log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d
))/sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)) - 2*d*((d +
e*x)**(5/2)*log(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*
x)/sqrt(-d))/sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(
d + e*x)**(5/2)/5)/(5*e)) + (d + e*x)**(7/2)*log(c*(-d/e + (d + e*x)/e)**n)
/7 - 2*n*(d**4*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**3*e*sqrt(d + e*
x) + d**2*e*(d + e*x)**(3/2)/3 + d*e*(d + e*x)**(5/2)/5 + e*(d + e*x)**(7/2
)/7)/(7*e))/e**3 + 2*b*(-d**3*((d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)*
*n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d + e*
x) + e*(d + e*x)**(3/2)/3)/(3*e)) + 3*d**2*((d + e*x)**(5/2)*log(c*(-d/e +
(d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*
*2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(d + e*x)**(5/2)/5)/(5*e))
- 3*d*((d + e*x)**(7/2)*log(c*(-d/e + (d + e*x)/e)**n)/7 - 2*n*(d**4*e*atan
(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**3*e*sqrt(d + e*x) + d**2*e*(d + e*x)
**(3/2)/3 + d*e*(d + e*x)**(5/2)/5 + e*(d + e*x)**(7/2)/7)/(7*e)) + (d + e*
x)**(9/2)*log(c*(-d/e + (d + e*x)/e)**n)/9 - 2*n*(d**5*e*atan(sqrt(d + e*x)
/sqrt(-d))/sqrt(-d) + d**4*e*sqrt(d + e*x) + d**3*e*(d + e*x)**(3/2)/3 + d*
*2*e*(d + e*x)**(5/2)/5 + d*e*(d + e*x)**(7/2)/7 + e*(d + e*x)**(9/2)/9)/(9
*e))/e**3
```

3.139 $\int x(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=163

$$-\frac{2d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}+\frac{2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^2}-\frac{8bd^{7/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{35e^2}+\frac{8bd^3n\sqrt{d+ex}}{35e^2}+\cdots$$

```
[Out] 8/105*b*d^2*n*(e*x+d)^(3/2)/e^2+8/175*b*d*n*(e*x+d)^(5/2)/e^2-4/49*b*n*(e*x
+d)^(7/2)/e^2-8/35*b*d^(7/2)*n*arctanh((e*x+d)^(1/2)/d^(1/2))/e^2-2/5*d*(e*
x+d)^(5/2)*(a+b*ln(c*x^n))/e^2+2/7*(e*x+d)^(7/2)*(a+b*ln(c*x^n))/e^2+8/35*b
*d^3*n*(e*x+d)^(1/2)/e^2
```

Rubi [A] time = 0.12, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {43, 2350, 12, 80, 50, 63, 208}

$$-\frac{2d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}+\frac{2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^2}+\frac{8bd^3n\sqrt{d+ex}}{35e^2}+\frac{8bd^2n(d+ex)^{3/2}}{105e^2}-\frac{8bd^{7/2}n\tanh\cdots}{3\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (8*b*d^3*n*Sqrt[d + e*x])/(35*e^2) + (8*b*d^2*n*(d + e*x)^(3/2))/(105*e^2)
+ (8*b*d*n*(d + e*x)^(5/2))/(175*e^2) - (4*b*n*(d + e*x)^(7/2))/(49*e^2) -
(8*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(35*e^2) - (2*d*(d + e*x)^(5
/2)*(a + b*Log[c*x^n]))/(5*e^2) + (2*(d + e*x)^(7/2)*(a + b*Log[c*x^n]))/(7
*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int x(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)dx = -\frac{2d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}+\frac{2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^2}-(bn)\int \frac{2}{}$$

$$= -\frac{2d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}+\frac{2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^2}-\frac{(2bn)\int}{}$$

$$= -\frac{4bn(d+ex)^{7/2}}{49e^2}-\frac{2d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}+\frac{2(d+ex)^{7/2}\left(a+b\log\right.}{7e^2}$$

$$= \frac{8bdn(d+ex)^{5/2}}{175e^2}-\frac{4bn(d+ex)^{7/2}}{49e^2}-\frac{2d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}+\frac{2(d+}{}$$

$$= \frac{8bd^2n(d+ex)^{3/2}}{105e^2}+\frac{8bdn(d+ex)^{5/2}}{175e^2}-\frac{4bn(d+ex)^{7/2}}{49e^2}-\frac{2d(d+ex)^{5/2}\left(a+b\right.}{5e^2}$$

$$= \frac{8bd^3n\sqrt{d+ex}}{35e^2}+\frac{8bd^2n(d+ex)^{3/2}}{105e^2}+\frac{8bdn(d+ex)^{5/2}}{175e^2}-\frac{4bn(d+ex)^{7/2}}{49e^2}-$$

$$= \frac{8bd^3n\sqrt{d+ex}}{35e^2}+\frac{8bd^2n(d+ex)^{3/2}}{105e^2}+\frac{8bdn(d+ex)^{5/2}}{175e^2}-\frac{4bn(d+ex)^{7/2}}{49e^2}-$$

$$= \frac{8bd^3n\sqrt{d+ex}}{35e^2}+\frac{8bd^2n(d+ex)^{3/2}}{105e^2}+\frac{8bdn(d+ex)^{5/2}}{175e^2}-\frac{4bn(d+ex)^{7/2}}{49e^2}-$$

Mathematica [A] time = 0.18, size = 120, normalized size = 0.74

$$-\frac{2\left(\sqrt{d+ex}\left(105a(2d-5ex)(d+ex)^2+105b(2d-5ex)(d+ex)^2\log\left(cx^n\right)+2bn\left(-247d^3+71d^2ex+183de^2x^2+\right.\right.\right.}{3675e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-2*(420*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(105*a*
(2*d - 5*e*x)*(d + e*x)^2 + 2*b*n*(-247*d^3 + 71*d^2*e*x + 183*d*e^2*x^2 +
75*e^3*x^3) + 105*b*(2*d - 5*e*x)*(d + e*x)^2*Log[c*x^n])))/(3675*e^2)
```

fricas [A] time = 0.44, size = 391, normalized size = 2.40

$$\left[\frac{2\left(210\,bd^{\frac{7}{2}}n\log\left(\frac{ex-2\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)+\left(494\,bd^3n-210\,ad^3-75\left(2\,be^3n-7\,ae^3\right)x^3-6\left(61\,bde^2n-140\,ade^2\right)x^2\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [2/3675*(210*b*d^(7/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (49
4*b*d^3*n - 210*a*d^3 - 75*(2*b*e^3*n - 7*a*e^3)*x^3 - 6*(61*b*d*e^2*n - 14
0*a*d*e^2)*x^2 - (142*b*d^2*e*n - 105*a*d^2*e)*x + 105*(5*b*e^3*x^3 + 8*b*d
*e^2*x^2 + b*d^2*e*x - 2*b*d^3)*log(c) + 105*(5*b*e^3*n*x^3 + 8*b*d*e^2*n*x
^2 + b*d^2*e*n*x - 2*b*d^3*n)*log(x))*sqrt(e*x + d))/e^2, 2/3675*(420*b*sqr
t(-d)*d^3*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (494*b*d^3*n - 210*a*d^3 - 7
5*(2*b*e^3*n - 7*a*e^3)*x^3 - 6*(61*b*d*e^2*n - 140*a*d*e^2)*x^2 - (142*b*d
^2*e*n - 105*a*d^2*e)*x + 105*(5*b*e^3*x^3 + 8*b*d*e^2*x^2 + b*d^2*e*x - 2*
b*d^3)*log(c) + 105*(5*b*e^3*n*x^3 + 8*b*d*e^2*n*x^2 + b*d^2*e*n*x - 2*b*d^
3*n)*log(x))*sqrt(e*x + d))/e^2]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex+d)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)*x, x)
```

maple [F] time = 0.45, size = 0, normalized size = 0.00

$$\int (ex+d)^{\frac{3}{2}}\left(b\ln\left(c\,x^n\right)+a\right)x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

```
[Out] int(x*(e*x+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

maxima [A] time = 1.25, size = 155, normalized size = 0.95

$$\frac{4}{3675}\left(\frac{105\,d^{\frac{7}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^2}-\frac{75\,(ex+d)^{\frac{7}{2}}-42\,(ex+d)^{\frac{5}{2}}d-70\,(ex+d)^{\frac{3}{2}}d^2-210\,\sqrt{ex+d}\,d^3}{e^2}\right)bn+\frac{2}{35}\left(5\,(e\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] 4/3675*(105*d^(7/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d))
)/e^2 - (75*(e*x + d)^(7/2) - 42*(e*x + d)^(5/2)*d - 70*(e*x + d)^(3/2)*d^2
 - 210*sqrt(e*x + d)*d^3)/e^2)*b*n + 2/35*(5*(e*x + d)^(7/2)/e^2 - 7*(e*x +
 d)^(5/2)*d/e^2)*b*log(c*x^n) + 2/35*(5*(e*x + d)^(7/2)/e^2 - 7*(e*x + d)^(
5/2)*d/e^2)*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,{\left(d+e\,x\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*log(c*x^n))*(d + e*x)^(3/2),x)
```

```
[Out] int(x*(a + b*log(c*x^n))*(d + e*x)^(3/2), x)
```

sympy [B] time = 69.89, size = 583, normalized size = 3.58

$$\frac{2ad\left(-\frac{d(d+ex)^{\frac{3}{2}}}{3}+\frac{(d+ex)^{\frac{5}{2}}}{5}\right)}{e^2}+\frac{2a\left(\frac{d^2(d+ex)^{\frac{3}{2}}}{3}-\frac{2d(d+ex)^{\frac{5}{2}}}{5}+\frac{(d+ex)^{\frac{7}{2}}}{7}\right)}{e^2}+\frac{2bd\left(-d\left(\frac{(d+ex)^{\frac{3}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{3}-\frac{2n\left(\frac{d^2e\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}\right.}{}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] 2*a*d*(-d*(d + e*x)**(3/2)/3 + (d + e*x)**(5/2)/5)/e**2 + 2*a*(d**2*(d + e*
x)**(3/2)/3 - 2*d*(d + e*x)**(5/2)/5 + (d + e*x)**(7/2)/7)/e**2 + 2*b*d*(-d
*((d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt
(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3
*e)) + (d + e*x)**(5/2)*log(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan
(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(
3/2)/3 + e*(d + e*x)**(5/2)/5)/(5*e))/e**2 + 2*b*(d**2*((d + e*x)**(3/2)*lo
g(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/s
qrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)) - 2*d*((d + e*x)
**(5/2)*log(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*x)/s
qrt(-d))/sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(d +
e*x)**(5/2)/5)/(5*e)) + (d + e*x)**(7/2)*log(c*(-d/e + (d + e*x)/e)**n)/7 -
 2*n*(d**4*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**3*e*sqrt(d + e*x) +
 d**2*e*(d + e*x)**(3/2)/3 + d*e*(d + e*x)**(5/2)/5 + e*(d + e*x)**(7/2)/7)
/(7*e))/e**2
```

3.140 $\int (d+ex)^{3/2} \left(a+b\log\left(cx^n\right)\right) \, dx$

Optimal. Leaf size=115

$$\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}+\frac{4bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{5e}-\frac{4bd^2n\sqrt{d+ex}}{5e}-\frac{4bdn(d+ex)^{3/2}}{15e}-\frac{4bn(d+ex)^{5/2}}{25e}$$

```
[Out] -4/15*b*d*n*(e*x+d)^(3/2)/e-4/25*b*n*(e*x+d)^(5/2)/e+4/5*b*d^(5/2)*n*arctan
h((e*x+d)^(1/2)/d^(1/2))/e+2/5*(e*x+d)^(5/2)*(a+b*ln(c*x^n))/e-4/5*b*d^2*n*
(e*x+d)^(1/2)/e
```

Rubi [A] time = 0.05, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2319, 50, 63, 208}

$$\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}-\frac{4bd^2n\sqrt{d+ex}}{5e}+\frac{4bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{5e}-\frac{4bdn(d+ex)^{3/2}}{15e}-\frac{4bn(d+ex)^{5/2}}{25e}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-4*b*d^2*n*Sqrt[d + e*x])/(5*e) - (4*b*d*n*(d + e*x)^(3/2))/(15*e) - (4*b*
n*(d + e*x)^(5/2))/(25*e) + (4*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/
(5*e) + (2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e)
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rubi steps

$$\int (d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)\,dx = \frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e} - \frac{(2bn)\int \frac{(d+ex)^{5/2}}{x}\,dx}{5e}$$
$$= -\frac{4bn(d+ex)^{5/2}}{25e} + \frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e} - \frac{(2bdn)\int \frac{(d+ex)^{3/2}}{x}\,dx}{5e}$$
$$= -\frac{4bdn(d+ex)^{3/2}}{15e} - \frac{4bn(d+ex)^{5/2}}{25e} + \frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e} - \frac{\left(2bd^2n\right.}{}$$
$$= -\frac{4bd^2n\sqrt{d+ex}}{5e} - \frac{4bdn(d+ex)^{3/2}}{15e} - \frac{4bn(d+ex)^{5/2}}{25e} + \frac{2(d+ex)^{5/2}\left(a+b\log\right.}{5e}$$
$$= -\frac{4bd^2n\sqrt{d+ex}}{5e} - \frac{4bdn(d+ex)^{3/2}}{15e} - \frac{4bn(d+ex)^{5/2}}{25e} + \frac{2(d+ex)^{5/2}\left(a+b\log\right.}{5e}$$
$$= -\frac{4bd^2n\sqrt{d+ex}}{5e} - \frac{4bdn(d+ex)^{3/2}}{15e} - \frac{4bn(d+ex)^{5/2}}{25e} + \frac{4bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+e}}{\sqrt{d}}\right.}{5e}$$

Mathematica [A] time = 0.11, size = 87, normalized size = 0.76

$$\frac{2\left((d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)+2bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)-\frac{2}{15}bn\sqrt{d+ex}\left(23d^2+11dex+3e^2x^2\right)\right)}{5e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*((-2*b*n*Sqrt[d + e*x]*(23*d^2 + 11*d*e*x + 3*e^2*x^2))/15 + 2*b*d^(5/2)
*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + (d + e*x)^(5/2)*(a + b*Log[c*x^n])))/(5
*e)
```

fricas [A] time = 0.44, size = 288, normalized size = 2.50

$$\left[\frac{2\left(15\,bd^{\frac{5}{2}}n\log\left(\frac{ex+2\sqrt{ex+d}\sqrt{d}+2d}{x}\right)-\left(46\,bd^2n-15\,ad^2+3\left(2\,be^2n-5\,ae^2\right)x^2+2\,(11\,bden-15\,ade)x-15\left(be^2x^2\right.\right.}{75\,e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [2/75*(15*b*d^(5/2)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - (46*b*
d^2*n - 15*a*d^2 + 3*(2*b*e^2*n - 5*a*e^2)*x^2 + 2*(11*b*d*e*n - 15*a*d*e)*
x - 15*(b*e^2*x^2 + 2*b*d*e*x + b*d^2)*log(c) - 15*(b*e^2*n*x^2 + 2*b*d*e*n
*x + b*d^2*n)*log(x))*sqrt(e*x + d))/e, -2/75*(30*b*sqrt(-d)*d^2*n*arctan(s
qrt(e*x + d)*sqrt(-d)/d) + (46*b*d^2*n - 15*a*d^2 + 3*(2*b*e^2*n - 5*a*e^2)
*x^2 + 2*(11*b*d*e*n - 15*a*d*e)*x - 15*(b*e^2*x^2 + 2*b*d*e*x + b*d^2)*log
(c) - 15*(b*e^2*n*x^2 + 2*b*d*e*n*x + b*d^2*n)*log(x))*sqrt(e*x + d))/e]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex+d)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a), x)
```

maple [F] time = 0.43, size = 0, normalized size = 0.00

$$\int (ex+d)^{\frac{3}{2}} (b \ln (c\, x^{n})+a)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

```
[Out] int((e*x+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

maxima [A] time = 1.32, size = 105, normalized size = 0.91

$$\frac{2\,(ex+d)^{\frac{5}{2}} b \log (cx^{n})}{5\,e}+\frac{2\,(ex+d)^{\frac{5}{2}} a}{5\,e}-\frac{2\left(15\,d^{\frac{5}{2}} \log \left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)+6\,(ex+d)^{\frac{5}{2}}+10\,(ex+d)^{\frac{3}{2}} d+30\,\sqrt{ex+d}\,d^{2}\right)}{75\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] 2/5*(e*x + d)^(5/2)*b*log(c*x^n)/e + 2/5*(e*x + d)^(5/2)*a/e - 2/75*(15*d^(
5/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d))) + 6*(e*x + d)
^(5/2) + 10*(e*x + d)^(3/2)*d + 30*sqrt(e*x + d)*d^2)*b*n/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (a+b\,\ln (c\,x^{n}))\,(d+e\,x)^{3/2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))*(d + e*x)^(3/2),x)
```

```
[Out] int((a + b*log(c*x^n))*(d + e*x)^(3/2), x)
```

sympy [A] time = 38.36, size = 333, normalized size = 2.90

$$ad\left(\begin{cases} \sqrt{d}\,x & \text{for}\ e=0 \\ \frac{2(d+ex)^{\frac{3}{2}}}{3e} & \text{otherwise} \end{cases}\right)+\frac{2a\left(-\frac{d(d+ex)^{\frac{3}{2}}}{3}+\frac{(d+ex)^{\frac{5}{2}}}{5}\right)}{e}+\frac{2bd\left(\frac{(d+ex)^{\frac{3}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^{n}\right)}{3}-\frac{2n\left(\frac{d^{2}e\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}+de\sqrt{d+ex}+\cdots\right)}{3e}\right)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*Piecewise((sqrt(d)*x, Eq(e, 0)), (2*(d + e*x)**(3/2)/(3*e), True)) + 2*
a*(-d*(d + e*x)**(3/2)/3 + (d + e*x)**(5/2)/5)/e + 2*b*d*((d + e*x)**(3/2)*
log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))
/sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e))/e + 2*b*(-d*((
d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d
+ e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)
) + (d + e*x)**(5/2)*log(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sq
rt(d + e*x)/sqrt(-d))/sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2
)/3 + e*(d + e*x)**(5/2)/5)/(5*e))/e
```

3.141 $\int \frac{(d+ex)^{3/2}\left(a+b\log(cx^n)\right)}{x}\,dx$

Optimal. Leaf size=255

$$-2d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{2}{3}(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)+2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)-2bd^{3/2}n\mathrm{Li}$$

```
[Out] -4/9*b*n*(e*x+d)^(3/2)+16/3*b*d^(3/2)*n*arctanh((e*x+d)^(1/2)/d^(1/2))+2*b*
d^(3/2)*n*arctanh((e*x+d)^(1/2)/d^(1/2))^2+2/3*(e*x+d)^(3/2)*(a+b*ln(c*x^n)
)-2*d^(3/2)*arctanh((e*x+d)^(1/2)/d^(1/2))*(a+b*ln(c*x^n))-4*b*d^(3/2)*n*ar
ctanh((e*x+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))-2*b*d^(3
/2)*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))-16/3*b*d*n*(e*x+d)^(1/
2)+2*d*(a+b*ln(c*x^n))*(e*x+d)^(1/2)
```

Rubi [A] time = 0.46, antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {2346, 63, 208, 2348, 12, 5984, 5918, 2402, 2315, 2319, 50}

$$-2bd^{3/2}n\,\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)-2d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{2}{3}(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-16*b*d*n*Sqrt[d + e*x])/3 - (4*b*n*(d + e*x)^(3/2))/9 + (16*b*d^(3/2)*n*A
rcTanh[Sqrt[d + e*x]/Sqrt[d]])/3 + 2*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt
[d]]^2 + 2*d*Sqrt[d + e*x]*(a + b*Log[c*x^n]) + (2*(d + e*x)^(3/2)*(a + b*L
og[c*x^n]))/3 - 2*d^(3/2)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n])
 - 4*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] -
Sqrt[d + e*x])] - 2*b*d^(3/2)*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[
d + e*x])]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2346

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[((d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p)/x,
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}\,dx = d\int \frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{x}\,dx + e\int \sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)dx$$

$$= \frac{2}{3}(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right) + d^2\int \frac{a+b\log\left(cx^n\right)}{x\sqrt{d+ex}}\,dx + (de)\int \frac{a+b\log(}{\sqrt{d+ex}}$$

$$= -\frac{4}{9}bn(d+ex)^{3/2} + 2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right) + \frac{2}{3}(d+ex)^{3/2}\left(a+b\log(cx\right.$$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + 2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right) + \frac{2}{3}(d+ex$$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + 2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right) + \frac{2}{3}(d+ex$$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + \frac{16}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2bd^{3/2}n\,t$$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + \frac{16}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2bd^{3/2}n\,t$$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + \frac{16}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2bd^{3/2}n\,t$$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + \frac{16}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2bd^{3/2}n\,t$$

Mathematica [A] time = 0.30, size = 375, normalized size = 1.47

$$d^{3/2}\log\left(\sqrt{d}-\sqrt{d+ex}\right)\left(a+b\log\left(cx^n\right)\right) - d^{3/2}\log\left(\sqrt{d+ex}+\sqrt{d}\right)\left(a+b\log\left(cx^n\right)\right) + \frac{2}{3}(d+ex)^{3/2}\left(a+b\log(cx^n\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] 2*a*d*Sqrt[d + e*x] - (4*b*n*(d + e*x)^(3/2))/9 + (16*b*d*n*(-Sqrt[d + e*x]
 + Sqrt[d]*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]))/3 + 2*b*d*Sqrt[d + e*x]*Log[c*x
^n] + (2*(d + e*x)^(3/2)*(a + b*Log[c*x^n]))/3 + d^(3/2)*(a + b*Log[c*x^n])
*Log[Sqrt[d] - Sqrt[d + e*x]] - d^(3/2)*(a + b*Log[c*x^n])*Log[Sqrt[d] + Sq
rt[d + e*x]] - (b*d^(3/2)*n*(Log[Sqrt[d] - Sqrt[d + e*x]]*(Log[Sqrt[d] - Sq
rt[d + e*x]] + 2*Log[(1 + Sqrt[d + e*x]/Sqrt[d])/2]) + 2*PolyLog[2, 1/2 - S
qrt[d + e*x]/(2*Sqrt[d])]))/2 + (b*d^(3/2)*n*(Log[Sqrt[d] + Sqrt[d + e*x]]*
(Log[Sqrt[d] + Sqrt[d + e*x]] + 2*Log[1/2 - Sqrt[d + e*x]/(2*Sqrt[d])]) + 2
*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2]))/2
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(bex+bd)\sqrt{ex+d}\,\log\left(cx^n\right)+(aex+ad)\sqrt{ex+d}}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x + b*d)*sqrt(e*x + d)*log(c*x^n) + (a*e*x + a*d)*sqrt(e*x +
 d))/x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex+d)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)/x, x)
```

maple [F] time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{(ex+d)^{\frac{3}{2}}\left(b\ln\left(c\,x^n\right)+a\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^(3/2)*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] int((e*x+d)^(3/2)*(b*ln(c*x^n)+a)/x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\left(3\,d^{\frac{3}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)+2\,(ex+d)^{\frac{3}{2}}+6\,\sqrt{ex+d}\,d\right)a+b\int\frac{\left(ex\log(c)+d\log(c)+(ex+d)\log\left(x^n\right)\right)\sqrt{ex}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] 1/3*(3*d^(3/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d))) + 2
*(e*x + d)^(3/2) + 6*sqrt(e*x + d)*d)*a + b*integrate((e*x*log(c) + d*log(c
) + (e*x + d)*log(x^n))*sqrt(e*x + d)/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\ln\left(c\,x^n\right)\right)\,{\left(d+e\,x\right)}^{3/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^(3/2))/x,x)
```

```
[Out] int(((a + b*log(c*x^n))*(d + e*x)^(3/2))/x, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**(3/2)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Timed out
```

3.142 $\int \frac{(d+ex)^{3/2}\left(a+b\log(cx^n)\right)}{x^2}\,dx$

Optimal. Leaf size=259

$$-\frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}+3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)-3\sqrt{d}\,e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)-3b\sqrt{d}\,en\mathrm{L}$$

```
[Out] -(e*x+d)^(3/2)*(a+b*ln(c*x^n))/x+3*b*e*n*arctanh((e*x+d)^(1/2)/d^(1/2))*d^(
1/2)+3*b*e*n*arctanh((e*x+d)^(1/2)/d^(1/2))^2*d^(1/2)-3*e*arctanh((e*x+d)^(
1/2)/d^(1/2))*(a+b*ln(c*x^n))*d^(1/2)-6*b*e*n*arctanh((e*x+d)^(1/2)/d^(1/2)
)*ln(2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))*d^(1/2)-3*b*e*n*polylog(2,1-2*d^(1/
2)/(d^(1/2)-(e*x+d)^(1/2)))*d^(1/2)-4*b*e*n*(e*x+d)^(1/2)-b*d*n*(e*x+d)^(1/
2)/x+3*e*(a+b*ln(c*x^n))*(e*x+d)^(1/2)
```

Rubi [A] time = 0.32, antiderivative size = 259, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {47, 50, 63, 208, 2350, 14, 5984, 5918, 2402, 2315}

$$-3b\sqrt{d}\,en\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)-\frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}+3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)-3\sqrt{d}\,e\tanh$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -4*b*e*n*Sqrt[d + e*x] - (b*d*n*Sqrt[d + e*x])/x + 3*b*Sqrt[d]*e*n*ArcTanh[
Sqrt[d + e*x]/Sqrt[d]] + 3*b*Sqrt[d]*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2 +
 3*e*Sqrt[d + e*x]*(a + b*Log[c*x^n]) - ((d + e*x)^(3/2)*(a + b*Log[c*x^n])
)/x - 3*Sqrt[d]*e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]) - 6*b*S
qrt[d]*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d
 + e*x])] - 3*b*Sqrt[d]*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d +
e*x])]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx = 3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right) - \frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x} - 3\sqrt{d}\,e\tanh^{-1}\Bigg($$

$$= 3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right) - \frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x} - 3\sqrt{d}\,e\tanh^{-1}\Bigg($$

$$= 3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right) - \frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x} - 3\sqrt{d}\,e\tanh^{-1}\Bigg($$

$$= -4ben\sqrt{d+ex} - \frac{bdn\sqrt{d+ex}}{x} + 3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right) - \frac{(d+ex)^{3/2}\left(a\right.}{}$$

$$= -4ben\sqrt{d+ex} - \frac{bdn\sqrt{d+ex}}{x} + 3b\sqrt{d}\,en\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2 + 3e\sqrt{d+ex}\,\Big($$

$$= -4ben\sqrt{d+ex} - \frac{bdn\sqrt{d+ex}}{x} + 3b\sqrt{d}\,en\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 3b\sqrt{d}\,en\tanh$$

$$= -4ben\sqrt{d+ex} - \frac{bdn\sqrt{d+ex}}{x} + 3b\sqrt{d}\,en\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 3b\sqrt{d}\,en\tanh$$

$$= -4ben\sqrt{d+ex} - \frac{bdn\sqrt{d+ex}}{x} + 3b\sqrt{d}\,en\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 3b\sqrt{d}\,en\tanh$$

Mathematica [A] time = 0.34, size = 480, normalized size = 1.85

$$\frac{-4ad\sqrt{d+ex} + 8aex\sqrt{d+ex} + 6a\sqrt{d}\,ex\log\left(\sqrt{d}-\sqrt{d+ex}\right) - 6a\sqrt{d}\,ex\log\left(\sqrt{d+ex}+\sqrt{d}\right) + 6b\sqrt{d}\,ex\log\left(cx\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] (-4*a*d*Sqrt[d + e*x] - 4*b*d*n*Sqrt[d + e*x] + 8*a*e*x*Sqrt[d + e*x] - 16*
b*e*n*x*Sqrt[d + e*x] + 12*b*Sqrt[d]*e*n*x*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] -
 4*b*d*Sqrt[d + e*x]*Log[c*x^n] + 8*b*e*x*Sqrt[d + e*x]*Log[c*x^n] + 6*a*Sq
rt[d]*e*x*Log[Sqrt[d] - Sqrt[d + e*x]] + 6*b*Sqrt[d]*e*x*Log[c*x^n]*Log[Sqr
t[d] - Sqrt[d + e*x]] - 3*b*Sqrt[d]*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]^2 -
6*a*Sqrt[d]*e*x*Log[Sqrt[d] + Sqrt[d + e*x]] - 6*b*Sqrt[d]*e*x*Log[c*x^n]*L
og[Sqrt[d] + Sqrt[d + e*x]] + 3*b*Sqrt[d]*e*n*x*Log[Sqrt[d] + Sqrt[d + e*x]
]^2 + 6*b*Sqrt[d]*e*n*x*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1/2 - Sqrt[d + e*x
]/(2*Sqrt[d])] - 6*b*Sqrt[d]*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]*Log[(1 + Sq
rt[d + e*x]/Sqrt[d])/2] - 6*b*Sqrt[d]*e*n*x*PolyLog[2, 1/2 - Sqrt[d + e*x]/
(2*Sqrt[d])] + 6*b*Sqrt[d]*e*n*x*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2])
/(4*x)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(bex+bd)\sqrt{ex+d}\,\log\left(cx^n\right) + (aex+ad)\sqrt{ex+d}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x + b*d)*sqrt(e*x + d)*log(c*x^n) + (a*e*x + a*d)*sqrt(e*x +
 d))/x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex+d)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)/x^2, x)
```

maple [F] time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{(ex+d)^{\frac{3}{2}}\left(b\ln\left(c\,x^n\right)+a\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^(3/2)*(b*ln(c*x^n)+a)/x^2,x)
```

```
[Out] int((e*x+d)^(3/2)*(b*ln(c*x^n)+a)/x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\left(3\sqrt{d}\,e\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)+4\sqrt{ex+d}\,e-\frac{2\sqrt{ex+d}\,d}{x}\right)a+b\int \frac{\left(ex\log(c)+d\log(c)+(ex+d)\log\left(x^n\right)\right)\sqrt{}}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] 1/2*(3*sqrt(d)*e*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d))) +
 4*sqrt(e*x + d)*e - 2*sqrt(e*x + d)*d/x)*a + b*integrate((e*x*log(c) + d*l
og(c) + (e*x + d)*log(x^n))*sqrt(e*x + d)/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\ln\left(c\,x^n\right)\right)\,{\left(d+e\,x\right)}^{3/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^(3/2))/x^2,x)
```

```
[Out] int(((a + b*log(c*x^n))*(d + e*x)^(3/2))/x^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**(3/2)*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] Timed out
```

3.143 $\int \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=293

$$-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4\sqrt{d}}-\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4x}-\frac{(d+ex)^{3/2}(a+b\log(cx^n))}{2x^2}-\frac{3be^2n\text{Li}_2\left(1-\ldots\right.}{4\sqrt{d}}$$

```
[Out] -1/2*(e*x+d)^(3/2)*(a+b*ln(c*x^n))/x^2-9/8*b*e^2*n*arctanh((e*x+d)^(1/2)/d^
(1/2))/d^(1/2)+3/4*b*e^2*n*arctanh((e*x+d)^(1/2)/d^(1/2))^2/d^(1/2)-3/4*e^2
*arctanh((e*x+d)^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/d^(1/2)-3/2*b*e^2*n*arctanh
((e*x+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))/d^(1/2)-3/4*b
*e^2*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))/d^(1/2)-1/4*b*d*n*(e*
x+d)^(1/2)/x^2-11/8*b*e*n*(e*x+d)^(1/2)/x-3/4*e*(a+b*ln(c*x^n))*(e*x+d)^(1/
2)/x
```

Rubi [A] time = 0.38, antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {47, 63, 208, 2350, 12, 14, 51, 5984, 5918, 2402, 2315}

$$-\frac{3be^2n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{4\sqrt{d}}-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4\sqrt{d}}-\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4x}-\frac{(d+ex)\ldots}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d*n*Sqrt[d + e*x])/(4*x^2) - (11*b*e*n*Sqrt[d + e*x])/(8*x) - (9*b*e^2*
n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(8*Sqrt[d]) + (3*b*e^2*n*ArcTanh[Sqrt[d +
 e*x]/Sqrt[d]]^2)/(4*Sqrt[d]) - (3*e*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(4*x
) - ((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(2*x^2) - (3*e^2*ArcTanh[Sqrt[d +
e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/(4*Sqrt[d]) - (3*b*e^2*n*ArcTanh[Sqrt[d +
 e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(2*Sqrt[d]) - (3
*b*e^2*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(4*Sqrt[d])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
```

```
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx = -\frac{3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{4x} - \frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{3e^2\tanh^{-1}\left(\right.}{}$$

$$= -\frac{3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{4x} - \frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{3e^2\tanh^{-1}\left(\right.}{}$$

$$= -\frac{3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{4x} - \frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{3e^2\tanh^{-1}\left(\right.}{}$$

$$= -\frac{3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{4x} - \frac{(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{3e^2\tanh^{-1}\left(\right.}{}$$

$$= -\frac{bdn\sqrt{d+ex}}{4x^2} - \frac{5ben\sqrt{d+ex}}{4x} - \frac{3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{4x} - \frac{(d+ex)^{3/2}\left(\right.}{}$$

$$= -\frac{bdn\sqrt{d+ex}}{4x^2} - \frac{11ben\sqrt{d+ex}}{8x} + \frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4\sqrt{d}} - \frac{3e\sqrt{d+ex}\left(a+\right.}{4x}$$

$$= -\frac{bdn\sqrt{d+ex}}{4x^2} - \frac{11ben\sqrt{d+ex}}{8x} - \frac{5be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4\sqrt{d}} + \frac{3be^2n\tanh^{-1}\left(\right.}{4\sqrt{d}}$$

$$= -\frac{bdn\sqrt{d+ex}}{4x^2} - \frac{11ben\sqrt{d+ex}}{8x} - \frac{9be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8\sqrt{d}} + \frac{3be^2n\tanh^{-1}\left(\right.}{4\sqrt{d}}$$

$$= -\frac{bdn\sqrt{d+ex}}{4x^2} - \frac{11ben\sqrt{d+ex}}{8x} - \frac{9be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8\sqrt{d}} + \frac{3be^2n\tanh^{-1}\left(\right.}{4\sqrt{d}}$$

Mathematica [A] time = 0.60, size = 501, normalized size = 1.71

$$-\frac{8ad^{3/2}\sqrt{d+ex} - 6ae^2x^2\log\left(\sqrt{d}-\sqrt{d+ex}\right) + 6ae^2x^2\log\left(\sqrt{d+ex}+\sqrt{d}\right) + 20a\sqrt{d}\,ex\sqrt{d+ex} + 8bd^{3/2}\sqrt{d+}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -1/16*(8*a*d^(3/2)*Sqrt[d + e*x] + 4*b*d^(3/2)*n*Sqrt[d + e*x] + 20*a*Sqrt[
d]*e*x*Sqrt[d + e*x] + 22*b*Sqrt[d]*e*n*x*Sqrt[d + e*x] + 18*b*e^2*n*x^2*Ar
cTanh[Sqrt[d + e*x]/Sqrt[d]] + 8*b*d^(3/2)*Sqrt[d + e*x]*Log[c*x^n] + 20*b*
Sqrt[d]*e*x*Sqrt[d + e*x]*Log[c*x^n] - 6*a*e^2*x^2*Log[Sqrt[d] - Sqrt[d + e
*x]] - 6*b*e^2*x^2*Log[c*x^n]*Log[Sqrt[d] - Sqrt[d + e*x]] + 3*b*e^2*n*x^2*
Log[Sqrt[d] - Sqrt[d + e*x]]^2 + 6*a*e^2*x^2*Log[Sqrt[d] + Sqrt[d + e*x]] +
```

```
 6*b*e^2*x^2*Log[c*x^n]*Log[Sqrt[d] + Sqrt[d + e*x]] - 3*b*e^2*n*x^2*Log[Sq
rt[d] + Sqrt[d + e*x]]^2 - 6*b*e^2*n*x^2*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1
/2 - Sqrt[d + e*x]/(2*Sqrt[d])] + 6*b*e^2*n*x^2*Log[Sqrt[d] - Sqrt[d + e*x]
]*Log[(1 + Sqrt[d + e*x]/Sqrt[d])/2] + 6*b*e^2*n*x^2*PolyLog[2, 1/2 - Sqrt[
d + e*x]/(2*Sqrt[d])] - 6*b*e^2*n*x^2*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d]
)/2])/(Sqrt[d]*x^2)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(bex+bd)\sqrt{ex+d}\,\log\left(cx^{n}\right)+(aex+ad)\sqrt{ex+d}}{x^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x + b*d)*sqrt(e*x + d)*log(c*x^n) + (a*e*x + a*d)*sqrt(e*x +
 d))/x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{(ex+d)^{\frac{3}{2}}\left(b\log\left(cx^{n}\right)+a\right)}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)/x^3, x)
```

maple [F] time = 0.38, size = 0, normalized size = 0.00

$$\int\frac{(ex+d)^{\frac{3}{2}}\left(b\ln\left(c\,x^{n}\right)+a\right)}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^(3/2)*(b*ln(c*x^n)+a)/x^3,x)
```

```
[Out] int((e*x+d)^(3/2)*(b*ln(c*x^n)+a)/x^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{8}\left(\frac{3\,e^{2}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{\sqrt{d}}-\frac{2\left(5\,(ex+d)^{\frac{3}{2}}e^{2}-3\,\sqrt{ex+d}\,de^{2}\right)}{(ex+d)^{2}-2\,(ex+d)d+d^{2}}\right)a+b\int\frac{\left(ex\log(c)+d\log(c)+(ex+d)\log\left(x^{n}\right)\right)\sqrt{ex+d}}{x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] 1/8*(3*e^2*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d)))/sqrt(d)
 - 2*(5*(e*x + d)^(3/2)*e^2 - 3*sqrt(e*x + d)*d*e^2)/((e*x + d)^2 - 2*(e*x
+ d)*d + d^2))*a + b*integrate((e*x*log(c) + d*log(c) + (e*x + d)*log(x^n))
*sqrt(e*x + d)/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\left(a+b\,\ln\left(c\,x^{n}\right)\right)\,{\left(d+e\,x\right)}^{3/2}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*log(c*x^n))*(d + e*x)^(3/2))/x^3,x)
[Out] int(((a + b*log(c*x^n))*(d + e*x)^(3/2))/x^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**(3/2)*(a+b*ln(c*x**n))/x**3,x)
[Out] Timed out
```

3.144 $\int \frac{x^3(a+b\log(cx^n))}{\sqrt{d+ex}}\,dx$

Optimal. Leaf size=217

$$-\frac{2d^3\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2d^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{6d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}+\frac{2(d+ex)^{7/2}}{}$$

```
[Out] -76/105*b*d^2*n*(e*x+d)^(3/2)/e^4+64/175*b*d*n*(e*x+d)^(5/2)/e^4-4/49*b*n*(
e*x+d)^(7/2)/e^4-64/35*b*d^(7/2)*n*arctanh((e*x+d)^(1/2)/d^(1/2))/e^4+2*d^2
*(e*x+d)^(3/2)*(a+b*ln(c*x^n))/e^4-6/5*d*(e*x+d)^(5/2)*(a+b*ln(c*x^n))/e^4+
2/7*(e*x+d)^(7/2)*(a+b*ln(c*x^n))/e^4+64/35*b*d^3*n*(e*x+d)^(1/2)/e^4-2*d^3
*(a+b*ln(c*x^n))*(e*x+d)^(1/2)/e^4
```

Rubi [A] time = 0.20, antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {43, 2350, 12, 1620, 50, 63, 208}

$$-\frac{2d^3\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2d^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{6d(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}+\frac{2(d+ex)^{7/2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (64*b*d^3*n*Sqrt[d + e*x])/(35*e^4) - (76*b*d^2*n*(d + e*x)^(3/2))/(105*e^4
) + (64*b*d*n*(d + e*x)^(5/2))/(175*e^4) - (4*b*n*(d + e*x)^(7/2))/(49*e^4)
 - (64*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(35*e^4) - (2*d^3*Sqrt[d
 + e*x]*(a + b*Log[c*x^n]))/e^4 + (2*d^2*(d + e*x)^(3/2)*(a + b*Log[c*x^n])
)/e^4 - (6*d*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4) + (2*(d + e*x)^(7/
2)*(a + b*Log[c*x^n]))/(7*e^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
```

```
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d+ex}}\,dx = -\frac{2d^3\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2d^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{6d(d+ex)^{5/2}\left(a\right.}{5e^4}$$

$$= -\frac{2d^3\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2d^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{6d(d+ex)^{5/2}\left(a\right.}{5e^4}$$

$$= -\frac{2d^3\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2d^2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{6d(d+ex)^{5/2}\left(a\right.}{5e^4}$$

$$= -\frac{76bd^2n(d+ex)^{3/2}}{105e^4}+\frac{64bdn(d+ex)^{5/2}}{175e^4}-\frac{4bn(d+ex)^{7/2}}{49e^4}-\frac{2d^3\sqrt{d+ex}\left(a+b\log\left(c\right.\right.}{e^4}$$

$$= \frac{64bd^3n\sqrt{d+ex}}{35e^4}-\frac{76bd^2n(d+ex)^{3/2}}{105e^4}+\frac{64bdn(d+ex)^{5/2}}{175e^4}-\frac{4bn(d+ex)^{7/2}}{49e^4}-\frac{2d^3\sqrt{d}}{}$$

$$= \frac{64bd^3n\sqrt{d+ex}}{35e^4}-\frac{76bd^2n(d+ex)^{3/2}}{105e^4}+\frac{64bdn(d+ex)^{5/2}}{175e^4}-\frac{4bn(d+ex)^{7/2}}{49e^4}-\frac{2d^3\sqrt{d}}{}$$

$$= \frac{64bd^3n\sqrt{d+ex}}{35e^4}-\frac{76bd^2n(d+ex)^{3/2}}{105e^4}+\frac{64bdn(d+ex)^{5/2}}{175e^4}-\frac{4bn(d+ex)^{7/2}}{49e^4}-\frac{64bd^{7/2}}{}$$

Mathematica [A] time = 0.23, size = 150, normalized size = 0.69

$$-\frac{2\left(\sqrt{d+ex}\left(105a\left(16d^3-8d^2ex+6de^2x^2-5e^3x^3\right)+105b\left(16d^3-8d^2ex+6de^2x^2-5e^3x^3\right)\log\left(cx^n\right)+2bn\left(-1\right.\right.\right.}{3675e^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (-2*(3360*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(105*a
*(16*d^3 - 8*d^2*e*x + 6*d*e^2*x^2 - 5*e^3*x^3) + 2*b*n*(-1276*d^3 + 218*d^
2*e*x - 111*d*e^2*x^2 + 75*e^3*x^3) + 105*b*(16*d^3 - 8*d^2*e*x + 6*d*e^2*x
^2 - 5*e^3*x^3)*Log[c*x^n])))/(3675*e^4)
```

fricas [A] time = 0.48, size = 395, normalized size = 1.82

$$\left[\frac{2\left(1680\, bd^{\frac{7}{2}} n \log\left(\frac{ex-2\,\sqrt{ex+d}\,\sqrt{d}+2\,d}{x}\right) + \left(2552\, bd^3 n - 1680\, ad^3 - 75\left(2\, be^3 n - 7\, ae^3\right)x^3 + 6\left(37\, bde^2 n - 105\, ade\right.\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/3675*(1680*b*d^(7/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (2
552*b*d^3*n - 1680*a*d^3 - 75*(2*b*e^3*n - 7*a*e^3)*x^3 + 6*(37*b*d*e^2*n -
 105*a*d*e^2)*x^2 - 4*(109*b*d^2*e*n - 210*a*d^2*e)*x + 105*(5*b*e^3*x^3 -
6*b*d*e^2*x^2 + 8*b*d^2*e*x - 16*b*d^3)*log(c) + 105*(5*b*e^3*n*x^3 - 6*b*d
*e^2*n*x^2 + 8*b*d^2*e*n*x - 16*b*d^3*n)*log(x))*sqrt(e*x + d))/e^4, 2/3675
*(3360*b*sqrt(-d)*d^3*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (2552*b*d^3*n -
1680*a*d^3 - 75*(2*b*e^3*n - 7*a*e^3)*x^3 + 6*(37*b*d*e^2*n - 105*a*d*e^2)*
x^2 - 4*(109*b*d^2*e*n - 210*a*d^2*e)*x + 105*(5*b*e^3*x^3 - 6*b*d*e^2*x^2
+ 8*b*d^2*e*x - 16*b*d^3)*log(c) + 105*(5*b*e^3*n*x^3 - 6*b*d*e^2*n*x^2 + 8
*b*d^2*e*n*x - 16*b*d^3*n)*log(x))*sqrt(e*x + d))/e^4]
```

giac [A] time = 0.83, size = 275, normalized size = 1.27

$$\frac{64\, bd^4 n \arctan\left(\frac{\sqrt{xe+d}}{\sqrt{-d}}\right) e^{(-4)}}{35\,\sqrt{-d}} + \frac{2}{3675}\left(525\,(xe+d)^{\frac{7}{2}} bn \log(xe) - 2205\,(xe+d)^{\frac{5}{2}} bdn \log(xe) + 3675\,(xe+d)^{\frac{3}{2}} b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] 64/35*b*d^4*n*arctan(sqrt(x*e + d)/sqrt(-d))*e^(-4)/sqrt(-d) + 2/3675*(525*
(x*e + d)^(7/2)*b*n*log(x*e) - 2205*(x*e + d)^(5/2)*b*d*n*log(x*e) + 3675*(
x*e + d)^(3/2)*b*d^2*n*log(x*e) - 3675*sqrt(x*e + d)*b*d^3*n*log(x*e) - 675
*(x*e + d)^(7/2)*b*n + 2877*(x*e + d)^(5/2)*b*d*n - 5005*(x*e + d)^(3/2)*b*
d^2*n + 7035*sqrt(x*e + d)*b*d^3*n + 525*(x*e + d)^(7/2)*b*log(c) - 2205*(x
*e + d)^(5/2)*b*d*log(c) + 3675*(x*e + d)^(3/2)*b*d^2*log(c) - 3675*sqrt(x*
e + d)*b*d^3*log(c) + 525*(x*e + d)^(7/2)*a - 2205*(x*e + d)^(5/2)*a*d + 36
75*(x*e + d)^(3/2)*a*d^2 - 3675*sqrt(x*e + d)*a*d^3)*e^(-4)
```

maple [F] time = 0.43, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n)+a)\,x^3}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(e*x+d)^(1/2),x)
```

```
[Out] int(x^3*(b*ln(c*x^n)+a)/(e*x+d)^(1/2),x)
```

maxima [A] time = 1.45, size = 215, normalized size = 0.99

$$\frac{4}{3675}\, bn\left(\frac{840\, d^{\frac{7}{2}} \log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^4} - \frac{75\,(ex+d)^{\frac{7}{2}} - 336\,(ex+d)^{\frac{5}{2}} d + 665\,(ex+d)^{\frac{3}{2}} d^2 - 1680\,\sqrt{ex+d}\, d^3}{e^4}\right) + \frac{2}{35}\, b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 4/3675*b*n*(840*d^(7/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt
(d)))/e^4 - (75*(e*x + d)^(7/2) - 336*(e*x + d)^(5/2)*d + 665*(e*x + d)^(3/
2)*d^2 - 1680*sqrt(e*x + d)*d^3)/e^4) + 2/35*b*(5*(e*x + d)^(7/2)/e^4 - 21*
(e*x + d)^(5/2)*d/e^4 + 35*(e*x + d)^(3/2)*d^2/e^4 - 35*sqrt(e*x + d)*d^3/e
^4)*log(c*x^n) + 2/35*a*(5*(e*x + d)^(7/2)/e^4 - 21*(e*x + d)^(5/2)*d/e^4 +
 35*(e*x + d)^(3/2)*d^2/e^4 - 35*sqrt(e*x + d)*d^3/e^4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\sqrt{d+e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x)^(1/2),x)
```

```
[Out] int((x^3*(a + b*log(c*x^n)))/(d + e*x)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

3.145 $\int \frac{x^2(a+b\log(cx^n))}{\sqrt{d+ex}}\,dx$

Optimal. Leaf size=169

$$\frac{2d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3}-\frac{4d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3}+\frac{32bd^{5/2}n\tanh^{-1}}{15e^3}$$

```
[Out] 28/45*b*d*n*(e*x+d)^(3/2)/e^3-4/25*b*n*(e*x+d)^(5/2)/e^3+32/15*b*d^(5/2)*n*
arctanh((e*x+d)^(1/2)/d^(1/2))/e^3-4/3*d*(e*x+d)^(3/2)*(a+b*ln(c*x^n))/e^3+
2/5*(e*x+d)^(5/2)*(a+b*ln(c*x^n))/e^3-32/15*b*d^2*n*(e*x+d)^(1/2)/e^3+2*d^2
*(a+b*ln(c*x^n))*(e*x+d)^(1/2)/e^3
```

Rubi [A] time = 0.17, antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {43, 2350, 12, 897, 1261, 208}

$$\frac{2d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3}-\frac{4d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3}-\frac{32bd^2n\sqrt{d+ex}}{15e^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (-32*b*d^2*n*Sqrt[d + e*x])/(15*e^3) + (28*b*d*n*(d + e*x)^(3/2))/(45*e^3)
- (4*b*n*(d + e*x)^(5/2))/(25*e^3) + (32*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/
Sqrt[d]])/(15*e^3) + (2*d^2*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e^3 - (4*d*(d
 + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) + (2*(d + e*x)^(5/2)*(a + b*Log[c
*x^n]))/(5*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d+ex}}\,dx = \frac{2d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{4d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} + \frac{2(d+ex)^{5/2}\left(a+b\,\mathrm{l}\right.}{5e^3}$$

$$= \frac{2d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{4d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} + \frac{2(d+ex)^{5/2}\left(a+b\,\mathrm{l}\right.}{5e^3}$$

$$= \frac{2d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{4d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} + \frac{2(d+ex)^{5/2}\left(a+b\,\mathrm{l}\right.}{5e^3}$$

$$= \frac{2d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{4d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} + \frac{2(d+ex)^{5/2}\left(a+b\,\mathrm{l}\right.}{5e^3}$$

$$= -\frac{32bd^2n\sqrt{d+ex}}{15e^3} + \frac{28bdn(d+ex)^{3/2}}{45e^3} - \frac{4bn(d+ex)^{5/2}}{25e^3} + \frac{2d^2\sqrt{d+ex}\left(a+b\log\left(cx\right.\right.}{e^3}$$

$$= -\frac{32bd^2n\sqrt{d+ex}}{15e^3} + \frac{28bdn(d+ex)^{3/2}}{45e^3} - \frac{4bn(d+ex)^{5/2}}{25e^3} + \frac{32bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{15e^3}$$

Mathematica [A] time = 0.18, size = 118, normalized size = 0.70

$$\frac{2\sqrt{d+ex}\left(15a\left(8d^2-4dex+3e^2x^2\right)+15b\left(8d^2-4dex+3e^2x^2\right)\log\left(cx^n\right)-2bn\left(94d^2-17dex+9e^2x^2\right)\right)+480b}{225e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (480*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*Sqrt[d + e*x]*(15*a*(8*
d^2 - 4*d*e*x + 3*e^2*x^2) - 2*b*n*(94*d^2 - 17*d*e*x + 9*e^2*x^2) + 15*b*(
8*d^2 - 4*d*e*x + 3*e^2*x^2)*Log[c*x^n]))/(225*e^3)
```

fricas [A] time = 0.45, size = 296, normalized size = 1.75

$$\left[\frac{2\left(120\,bd^{\frac{5}{2}}n\log\left(\frac{ex+2\,\sqrt{ex+d}\,\sqrt{d}+2\,d}{x}\right)-\left(188\,bd^2n-120\,ad^2+9\left(2\,be^2n-5\,ae^2\right)x^2-2\left(17\,bden-30\,ade\right)x-15\left(3\,b\right.\right.\right.}{225\,e^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/225*(120*b*d^(5/2)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - (188
*b*d^2*n - 120*a*d^2 + 9*(2*b*e^2*n - 5*a*e^2)*x^2 - 2*(17*b*d*e*n - 30*a*d
*e)*x - 15*(3*b*e^2*x^2 - 4*b*d*e*x + 8*b*d^2)*log(c) - 15*(3*b*e^2*n*x^2 -
 4*b*d*e*n*x + 8*b*d^2*n)*log(x))*sqrt(e*x + d))/e^3, -2/225*(240*b*sqrt(-d
)*d^2*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (188*b*d^2*n - 120*a*d^2 + 9*(2*
b*e^2*n - 5*a*e^2)*x^2 - 2*(17*b*d*e*n - 30*a*d*e)*x - 15*(3*b*e^2*x^2 - 4*
b*d*e*x + 8*b*d^2)*log(c) - 15*(3*b*e^2*n*x^2 - 4*b*d*e*n*x + 8*b*d^2*n)*lo
g(x))*sqrt(e*x + d))/e^3]
```

giac [A] time = 0.94, size = 210, normalized size = 1.24

$$-\frac{32\,bd^3n\arctan\left(\frac{\sqrt{xe+d}}{\sqrt{-d}}\right)e^{(-3)}}{15\,\sqrt{-d}}+\frac{2}{225}\left(45\,(xe+d)^{\frac{5}{2}}bn\log(xe)-150\,(xe+d)^{\frac{3}{2}}bdn\log(xe)+225\,\sqrt{xe+d}\,bd^2n\,\mathrm{l}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] -32/15*b*d^3*n*arctan(sqrt(x*e + d)/sqrt(-d))*e^(-3)/sqrt(-d) + 2/225*(45*(
x*e + d)^(5/2)*b*n*log(x*e) - 150*(x*e + d)^(3/2)*b*d*n*log(x*e) + 225*sqrt
(x*e + d)*b*d^2*n*log(x*e) - 63*(x*e + d)^(5/2)*b*n + 220*(x*e + d)^(3/2)*b
*d*n - 465*sqrt(x*e + d)*b*d^2*n + 45*(x*e + d)^(5/2)*b*log(c) - 150*(x*e +
 d)^(3/2)*b*d*log(c) + 225*sqrt(x*e + d)*b*d^2*log(c) + 45*(x*e + d)^(5/2)*
a - 150*(x*e + d)^(3/2)*a*d + 225*sqrt(x*e + d)*a*d^2)*e^(-3)
```

maple [F] time = 0.43, size = 0, normalized size = 0.00

$$\int\frac{\left(b\ln\left(c\,x^{n}\right)+a\right)x^{2}}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(e*x+d)^(1/2),x)
```

```
[Out] int(x^2*(b*ln(c*x^n)+a)/(e*x+d)^(1/2),x)
```

maxima [A] time = 1.33, size = 172, normalized size = 1.02

$$-\frac{4}{225}\,bn\left(\frac{60\,d^{\frac{5}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^3}+\frac{9\,(ex+d)^{\frac{5}{2}}-35\,(ex+d)^{\frac{3}{2}}d+120\,\sqrt{ex+d}\,d^2}{e^3}\right)+\frac{2}{15}\,b\left(\frac{3\,(ex+d)^{\frac{5}{2}}}{e^3}-\frac{10\,(ex+}{e^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -4/225*b*n*(60*d^(5/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(
d)))/e^3 + (9*(e*x + d)^(5/2) - 35*(e*x + d)^(3/2)*d + 120*sqrt(e*x + d)*d^
2)/e^3) + 2/15*b*(3*(e*x + d)^(5/2)/e^3 - 10*(e*x + d)^(3/2)*d/e^3 + 15*sqr
t(e*x + d)*d^2/e^3)*log(c*x^n) + 2/15*a*(3*(e*x + d)^(5/2)/e^3 - 10*(e*x +
d)^(3/2)*d/e^3 + 15*sqrt(e*x + d)*d^2/e^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\sqrt{d+e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e*x)^(1/2),x)
```

```
[Out] int((x^2*(a + b*log(c*x^n)))/(d + e*x)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

3.146 $\int \frac{x(a+b\log(cx^n))}{\sqrt{d+ex}}\,dx$

Optimal. Leaf size=119

$$-\frac{2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}-\frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^2}+\frac{8bdn\sqrt{d+ex}}{3e^2}-\frac{4bn(d$$

```
[Out] -4/9*b*n*(e*x+d)^(3/2)/e^2-8/3*b*d^(3/2)*n*arctanh((e*x+d)^(1/2)/d^(1/2))/e
^2+2/3*(e*x+d)^(3/2)*(a+b*ln(c*x^n))/e^2+8/3*b*d*n*(e*x+d)^(1/2)/e^2-2*d*(a
+b*ln(c*x^n))*(e*x+d)^(1/2)/e^2
```

Rubi [A] time = 0.09, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {43, 2350, 12, 80, 50, 63, 208}

$$-\frac{2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}-\frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^2}+\frac{8bdn\sqrt{d+ex}}{3e^2}-\frac{4bn(d$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (8*b*d*n*Sqrt[d + e*x])/(3*e^2) - (4*b*n*(d + e*x)^(3/2))/(9*e^2) - (8*b*d^
(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(3*e^2) - (2*d*Sqrt[d + e*x]*(a + b
*Log[c*x^n]))/e^2 + (2*(d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
```

```
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d+ex}}\,dx = -\frac{2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}-(bn)\int\frac{2(-2d+ex)\sqrt{}}{3e^2x}$$

$$= -\frac{2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}-\frac{(2bn)\int\frac{(-2d+ex)\sqrt{d+ex}}{x}}{3e^2}$$

$$= -\frac{4bn(d+ex)^{3/2}}{9e^2}-\frac{2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}+\frac{(4b}{}$$

$$= \frac{8bdn\sqrt{d+ex}}{3e^2}-\frac{4bn(d+ex)^{3/2}}{9e^2}-\frac{2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2(d+ex)^{3/2}\left(a+b\,\mathrm{lo}\right.}{3e^2}$$

$$= \frac{8bdn\sqrt{d+ex}}{3e^2}-\frac{4bn(d+ex)^{3/2}}{9e^2}-\frac{2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2(d+ex)^{3/2}\left(a+b\,\mathrm{lo}\right.}{3e^2}$$

$$= \frac{8bdn\sqrt{d+ex}}{3e^2}-\frac{4bn(d+ex)^{3/2}}{9e^2}-\frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^2}-\frac{2d\sqrt{d+ex}\left(a+b\log\left(c\right.\right.}{e^2}$$

Mathematica [A] time = 0.11, size = 80, normalized size = 0.67

$$-\frac{2\left(\sqrt{d+ex}\left(6ad-3aex+b(6d-3ex)\log\left(cx^n\right)-10bdn+2benx\right)+12bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\right)}{9e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (-2*(12*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(6*a*d -
 10*b*d*n - 3*a*e*x + 2*b*e*n*x + b*(6*d - 3*e*x)*Log[c*x^n])))/(9*e^2)
```

fricas [A] time = 0.46, size = 189, normalized size = 1.59

$$\left[\frac{2\left(6\,bd^{\frac{3}{2}}n\log\left(\frac{ex-2\,\sqrt{ex+d}\,\sqrt{d}+2\,d}{x}\right)+\left(10\,bdn-6\,ad-(2\,ben-3\,ae)x+3\,(bex-2\,bd)\log(c)+3\,(benx-2\,bdn)\log\right.\right.}{9\,e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/9*(6*b*d^(3/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (10*b*d*
n - 6*a*d - (2*b*e*n - 3*a*e)*x + 3*(b*e*x - 2*b*d)*log(c) + 3*(b*e*n*x - 2
*b*d*n)*log(x))*sqrt(e*x + d))/e^2, 2/9*(12*b*sqrt(-d)*d*n*arctan(sqrt(e*x
+ d)*sqrt(-d)/d) + (10*b*d*n - 6*a*d - (2*b*e*n - 3*a*e)*x + 3*(b*e*x - 2*b
*d)*log(c) + 3*(b*e*n*x - 2*b*d*n)*log(x))*sqrt(e*x + d))/e^2]
```

giac [A] time = 0.76, size = 145, normalized size = 1.22

$$\frac{8\,bd^2n\arctan\left(\frac{\sqrt{xe+d}}{\sqrt{-d}}\right)e^{(-2)}}{3\,\sqrt{-d}}+\frac{2}{9}\left(3\,(xe+d)^{\frac{3}{2}}bn\log\left(xe\right)-9\,\sqrt{xe+d}\,bdn\log\left(xe\right)-5\,(xe+d)^{\frac{3}{2}}bn+21\,\sqrt{xe+d}\,b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] 8/3*b*d^2*n*arctan(sqrt(x*e + d)/sqrt(-d))*e^(-2)/sqrt(-d) + 2/9*(3*(x*e +
d)^(3/2)*b*n*log(x*e) - 9*sqrt(x*e + d)*b*d*n*log(x*e) - 5*(x*e + d)^(3/2)*
b*n + 21*sqrt(x*e + d)*b*d*n + 3*(x*e + d)^(3/2)*b*log(c) - 9*sqrt(x*e + d)
*b*d*log(c) + 3*(x*e + d)^(3/2)*a - 9*sqrt(x*e + d)*a*d)*e^(-2)
```

maple [F] time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^{n}\right)+a\right)x}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x+d)^(1/2),x)
```

```
[Out] int(x*(b*ln(c*x^n)+a)/(e*x+d)^(1/2),x)
```

maxima [A] time = 1.23, size = 127, normalized size = 1.07

$$\frac{4}{9}\,bn\left(\frac{3\,d^{\frac{3}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^2}-\frac{(ex+d)^{\frac{3}{2}}-6\,\sqrt{ex+d}\,d}{e^2}\right)+\frac{2}{3}\,b\left(\frac{(ex+d)^{\frac{3}{2}}}{e^2}-\frac{3\,\sqrt{ex+d}\,d}{e^2}\right)\log\left(cx^n\right)+\frac{2}{3}\,a\left(\frac{(ex+d)^{\frac{3}{2}}}{e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 4/9*b*n*(3*d^(3/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d)))
/e^2 - ((e*x + d)^(3/2) - 6*sqrt(e*x + d)*d)/e^2) + 2/3*b*((e*x + d)^(3/2)/
e^2 - 3*sqrt(e*x + d)*d/e^2)*log(c*x^n) + 2/3*a*((e*x + d)^(3/2)/e^2 - 3*sq
rt(e*x + d)*d/e^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\sqrt{d+e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x)^(1/2),x)
```

```
[Out] int((x*(a + b*log(c*x^n)))/(d + e*x)^(1/2), x)
```

<u>**sympy**</u> **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

3.147 $\int \frac{a+b\log(cx^n)}{\sqrt{d+ex}}\,dx$

Optimal. Leaf size=69

$$\frac{2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e}-\frac{4bn\sqrt{d+ex}}{e}+\frac{4b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e}$$

```
[Out] 4*b*n*arctanh((e*x+d)^(1/2)/d^(1/2))*d^(1/2)/e-4*b*n*(e*x+d)^(1/2)/e+2*(a+b
*ln(c*x^n))*(e*x+d)^(1/2)/e
```

Rubi [A] time = 0.03, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2319, 50, 63, 208}

$$\frac{2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e}-\frac{4bn\sqrt{d+ex}}{e}+\frac{4b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/Sqrt[d + e*x],x]
```

```
[Out] (-4*b*n*Sqrt[d + e*x])/e + (4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/e
 + (2*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{\sqrt{d+ex}}\,dx = \frac{2\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{e} - \frac{(2bn)\int \frac{\sqrt{d+ex}}{x}\,dx}{e}$$
$$= -\frac{4bn\sqrt{d+ex}}{e} + \frac{2\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{e} - \frac{(2bdn)\int \frac{1}{x\sqrt{d+ex}}\,dx}{e}$$
$$= -\frac{4bn\sqrt{d+ex}}{e} + \frac{2\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{e} - \frac{(4bdn)\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx, x, \sqrt{d+ex}\right)}{e^2}$$
$$= -\frac{4bn\sqrt{d+ex}}{e} + \frac{4b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e} + \frac{2\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{e}$$

Mathematica [A] time = 0.04, size = 55, normalized size = 0.80

$$\frac{2\sqrt{d+ex}\left(a+b\log(cx^n)-2bn\right)+4b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/Sqrt[d + e*x],x]
```

```
[Out] (4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*Sqrt[d + e*x]*(a - 2*b*n
+ b*Log[c*x^n]))/e
```

fricas [A] time = 0.50, size = 116, normalized size = 1.68

$$\left[\frac{2\left(b\sqrt{d}\,n\log\left(\frac{ex+2\sqrt{ex+d}\sqrt{d}+2d}{x}\right)+\left(bn\log(x)-2bn+b\log(c)+a\right)\sqrt{ex+d}\right)}{e}, -\frac{2\left(2b\sqrt{-d}\,n\arctan\left(\frac{\sqrt{ex+d}\sqrt{-d}}{d}\right)\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2*(b*sqrt(d)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (b*n*log(x)
- 2*b*n + b*log(c) + a)*sqrt(e*x + d))/e, -2*(2*b*sqrt(-d)*n*arctan(sqrt(e*
x + d)*sqrt(-d)/d) - (b*n*log(x) - 2*b*n + b*log(c) + a)*sqrt(e*x + d))/e]
```

giac [A] time = 0.34, size = 78, normalized size = 1.13

$$-2\left(\left(\frac{2d\arctan\left(\frac{\sqrt{xe+d}}{\sqrt{-d}}\right)}{\sqrt{-d}} - \sqrt{xe+d}\log(x) + 2\sqrt{xe+d}\right)bn - \sqrt{xe+d}\,b\log(c) - \sqrt{xe+d}\,a\right)e^{(-1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] -2*((2*d*arctan(sqrt(x*e + d)/sqrt(-d))/sqrt(-d) - sqrt(x*e + d)*log(x) + 2
*sqrt(x*e + d))*b*n - sqrt(x*e + d)*b*log(c) - sqrt(x*e + d)*a)*e^(-1)
```

maple [A] time = 0.04, size = 70, normalized size = 1.01

$$\frac{4b\sqrt{d}\,n\,\mathrm{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{e} - \frac{4\sqrt{ex+d}\,bn}{e} + \frac{2\sqrt{ex+d}\,b\ln(c\,x^n)}{e} + \frac{2\sqrt{ex+d}\,a}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x+d)^(1/2),x)
```

```
[Out] 4*b*n*arctanh((e*x+d)^(1/2)/d^(1/2))*d^(1/2)/e+2/e*ln(c*x^n)*(e*x+d)^(1/2)*
b-4*b*n*(e*x+d)^(1/2)/e+2/e*a*(e*x+d)^(1/2)
```

maxima [A] time = 1.35, size = 82, normalized size = 1.19

$$-\frac{2\left(\sqrt{d}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)+2\sqrt{ex+d}\right)bn}{e}+\frac{2\sqrt{ex+d}\,b\log\left(cx^{n}\right)}{e}+\frac{2\sqrt{ex+d}\,a}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -2*(sqrt(d)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d))) + 2*sq
rt(e*x + d))*b*n/e + 2*sqrt(e*x + d)*b*log(c*x^n)/e + 2*sqrt(e*x + d)*a/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{\sqrt{d+e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x)^(1/2),x)
```

```
[Out] int((a + b*log(c*x^n))/(d + e*x)^(1/2), x)
```

sympy [A] time = 27.88, size = 252, normalized size = 3.65

$$\begin{cases} \frac{-\frac{2ad}{\sqrt{d+ex}}-2a\left(-\frac{d}{\sqrt{d+ex}}-\sqrt{d+ex}\right)-2bd\left(\frac{\log\left(cx^{n}\right)}{\sqrt{d+ex}}-\frac{2n\operatorname{atan}\left(\frac{1}{\sqrt{-\frac{1}{d}}\sqrt{d+ex}}\right)}{d\sqrt{-\frac{1}{d}}}\right)-2b\left(-d\left(\frac{\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^{n}\right)}{\sqrt{d+ex}}-\frac{2n\operatorname{atan}\left(\frac{1}{\sqrt{-\frac{1}{d}}\sqrt{d+ex}}\right)}{d\sqrt{-\frac{1}{d}}}\right)-\sqrt{d+ex}\log\left(c\left(-\frac{d}{e}+\frac{d+e}{e}\right.\right.\right.}{e} \\ \frac{ax+b\left(-nx+x\log\left(cx^{n}\right)\right)}{\sqrt{d}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x+d)**(1/2),x)
```

```
[Out] Piecewise(((-2*a*d/sqrt(d + e*x) - 2*a*(-d/sqrt(d + e*x) - sqrt(d + e*x)) -
 2*b*d*(log(c*x**n)/sqrt(d + e*x) - 2*n*atan(1/(sqrt(-1/d)*sqrt(d + e*x)))/
(d*sqrt(-1/d))) - 2*b*(-d*(log(c*(-d/e + (d + e*x)/e)**n)/sqrt(d + e*x) - 2
*n*atan(1/(sqrt(-1/d)*sqrt(d + e*x)))/(d*sqrt(-1/d))) - sqrt(d + e*x)*log(c
*(-d/e + (d + e*x)/e)**n) - 2*n*(-e*sqrt(d + e*x) - e*atan(1/(sqrt(-1/d)*sq
rt(d + e*x)))/sqrt(-1/d))/e))/e, Ne(e, 0)), ((a*x + b*(-n*x + x*log(c*x**n)
))/sqrt(d), True))
```

3.148 $\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex}}\,dx$

Optimal. Leaf size=152

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}-\frac{2bn\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{d}}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}}-\frac{4bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)\tanh^{-}}{\sqrt{d}}$$

```
[Out] 2*b*n*arctanh((e*x+d)^(1/2)/d^(1/2))^2/d^(1/2)-2*arctanh((e*x+d)^(1/2)/d^(1
/2))*(a+b*ln(c*x^n))/d^(1/2)-4*b*n*arctanh((e*x+d)^(1/2)/d^(1/2))*ln(2*d^(1
/2)/(d^(1/2)-(e*x+d)^(1/2)))/d^(1/2)-2*b*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(
e*x+d)^(1/2)))/d^(1/2)
```

Rubi [A] time = 0.20, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {63, 208, 2348, 12, 5984, 5918, 2402, 2315}

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{d}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}}-\frac{4bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{\cdot}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x]),x]
```

```
[Out] (2*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/Sqrt[d] - (2*ArcTanh[Sqrt[d + e*x]
/Sqrt[d]]*(a + b*Log[c*x^n]))/Sqrt[d] - (4*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d
]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/Sqrt[d] - (2*b*n*PolyLog[2,
1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/Sqrt[d]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex}}\,dx = -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} - (bn)\int -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}\,x}\,dx$$

$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} + \frac{(2bn)\int \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}\,dx}{\sqrt{d}}$$

$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} + \frac{(4bn)\,\mathrm{Subst}\left(\int \frac{x\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{-d+x^2}\,dx, x, \sqrt{d+ex}\right)}{\sqrt{d}}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} - \frac{(4bn)\,\mathrm{Subst}\left(\int \frac{\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{1-\frac{x}{\sqrt{d}}}\right.}{d}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\log}{\sqrt{d}}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\log}{\sqrt{d}}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\log}{\sqrt{d}}$$

Mathematica [A] time = 0.10, size = 249, normalized size = 1.64

$$\frac{2\log\left(\sqrt{d}-\sqrt{d+ex}\right)\left(a+b\log\left(cx^n\right)\right)-2\log\left(\sqrt{d+ex}+\sqrt{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\left(2\text{Li}_2\left(\frac{1}{2}-\frac{\sqrt{d+ex}}{2\sqrt{d}}\right)+\log\left(\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x]),x]
```

```
[Out] (2*(a + b*Log[c*x^n])*Log[Sqrt[d] - Sqrt[d + e*x]] - 2*(a + b*Log[c*x^n])*L
og[Sqrt[d] + Sqrt[d + e*x]] - b*n*(Log[Sqrt[d] - Sqrt[d + e*x]]*(Log[Sqrt[d
] - Sqrt[d + e*x]] + 2*Log[(1 + Sqrt[d + e*x]/Sqrt[d])/2]) + 2*PolyLog[2, 1
/2 - Sqrt[d + e*x]/(2*Sqrt[d])]) + b*n*(Log[Sqrt[d] + Sqrt[d + e*x]]*(Log[S
qrt[d] + Sqrt[d + e*x]] + 2*Log[1/2 - Sqrt[d + e*x]/(2*Sqrt[d])]) + 2*PolyL
og[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2]))/(2*Sqrt[d])
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex+d}\,b\log\left(cx^n\right)+\sqrt{ex+d}\,a}{ex^2+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/(e*x^2 + d*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\sqrt{ex+d}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*x), x)
```

maple [F] time = 0.39, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right)+a}{\sqrt{ex+d}\;x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x/(e*x+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b\int \frac{\log(c)+\log\left(x^n\right)}{\sqrt{ex+d}\,x}\,dx+\frac{a\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{\sqrt{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] b*integrate((log(c) + log(x^n))/(sqrt(e*x + d)*x), x) + a*log((sqrt(e*x + d
) - sqrt(d))/(sqrt(e*x + d) + sqrt(d)))/sqrt(d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x\,\sqrt{d+e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x)^(1/2)),x)
[Out] int((a + b*log(c*x^n))/(x*(d + e*x)^(1/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x+d)**(1/2),x)
[Out] Timed out
```

3.149 $\int \frac{a+b\log(cx^n)}{x^2\sqrt{d+ex}}\,dx$

Optimal. Leaf size=226

$$\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{d^{3/2}}-\frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{dx}+\frac{ben\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{3/2}}-\frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}}-\frac{b\cdots}{\cdots}$$

```
[Out] -b*e*n*arctanh((e*x+d)^(1/2)/d^(1/2))/d^(3/2)-b*e*n*arctanh((e*x+d)^(1/2)/d
^(1/2))^2/d^(3/2)+e*arctanh((e*x+d)^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/d^(3/2)+
2*b*e*n*arctanh((e*x+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2))
)/d^(3/2)+b*e*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))/d^(3/2)-b*n*
(e*x+d)^(1/2)/d/x-(a+b*ln(c*x^n))*(e*x+d)^(1/2)/d/x
```

Rubi [A] time = 0.27, antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.435$, Rules used = {51, 63, 208, 2350, 14, 47, 5984, 5918, 2402, 2315}

$$\frac{ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{3/2}}+\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{d^{3/2}}-\frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{dx}-\frac{ben\tanh^{-1}\left(\frac{\sqrt{d+\cdots}}{\sqrt{\cdots}}\right.\cdots}{d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*Sqrt[d + e*x]),x]
```

```
[Out] -((b*n*Sqrt[d + e*x])/(d*x)) - (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(3/
2) - (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/d^(3/2) - (Sqrt[d + e*x]*(a +
 b*Log[c*x^n]))/(d*x) + (e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]
))/d^(3/2) + (2*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[
d] - Sqrt[d + e*x])])/d^(3/2) + (b*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d]
- Sqrt[d + e*x])])/d^(3/2)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
```

```
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2\sqrt{d+ex}}\,dx = -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} - (bn)\int \frac{-\frac{\sqrt{d+ex}}{d} + \frac{ex\,\mathrm{ta}}{}}{x^2}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} - (bn)\int\left(-\frac{\sqrt{d+ex}}{dx^2} + \right.$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} + \frac{(bn)\int \frac{\sqrt{d+ex}}{x^2}\,dx}{d} - \frac{(be}{}$$

$$= -\frac{bn\sqrt{d+ex}}{dx} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} - \frac{(2ben)}{}$$

$$= -\frac{bn\sqrt{d+ex}}{dx} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a}{d^{3/2}}$$

$$= -\frac{bn\sqrt{d+ex}}{dx} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx}$$

$$= -\frac{bn\sqrt{d+ex}}{dx} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx}$$

$$= -\frac{bn\sqrt{d+ex}}{dx} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx}$$

Mathematica [A] time = 0.26, size = 392, normalized size = 1.73

$$-\frac{4a\sqrt{d}\sqrt{d+ex} + 2aex\log\left(\sqrt{d}-\sqrt{d+ex}\right) - 2aex\log\left(\sqrt{d+ex}+\sqrt{d}\right) + 2bex\log(cx^n)\log\left(\sqrt{d}-\sqrt{d+ex}\right) +}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*Sqrt[d + e*x]),x]
```

```
[Out] -1/4*(4*a*Sqrt[d]*Sqrt[d + e*x] + 4*b*Sqrt[d]*n*Sqrt[d + e*x] + 4*b*e*n*x*A
rcTanh[Sqrt[d + e*x]/Sqrt[d]] + 4*b*Sqrt[d]*Sqrt[d + e*x]*Log[c*x^n] + 2*a*
e*x*Log[Sqrt[d] - Sqrt[d + e*x]] + 2*b*e*x*Log[c*x^n]*Log[Sqrt[d] - Sqrt[d
+ e*x]] - b*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]^2 - 2*a*e*x*Log[Sqrt[d] + Sq
rt[d + e*x]] - 2*b*e*x*Log[c*x^n]*Log[Sqrt[d] + Sqrt[d + e*x]] + b*e*n*x*Lo
g[Sqrt[d] + Sqrt[d + e*x]]^2 + 2*b*e*n*x*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1
/2 - Sqrt[d + e*x]/(2*Sqrt[d])] - 2*b*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]*Lo
g[(1 + Sqrt[d + e*x]/Sqrt[d])/2] - 2*b*e*n*x*PolyLog[2, 1/2 - Sqrt[d + e*x]
/(2*Sqrt[d])] + 2*b*e*n*x*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2])/(d^(3/
2)*x)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{ex+d}\,b\log(cx^n) + \sqrt{ex+d}\,a}{ex^3+dx^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/(e*x^3 + d*x^2), x)
```

giac **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{\sqrt{ex+d}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*x^2), x)
```

maple **[F]** time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{b\ln(c\,x^n)+a}{\sqrt{ex+d}\;x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(e*x+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^2/(e*x+d)^(1/2),x)
```

maxima **[F]** time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a\left(\frac{2\sqrt{ex+d}\,e}{(ex+d)d-d^2}+\frac{e\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{d^{\frac{3}{2}}}\right)+b\int\frac{\log(c)+\log(x^n)}{\sqrt{ex+d}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/2*a*(2*sqrt(e*x + d)*e/((e*x + d)*d - d^2) + e*log((sqrt(e*x + d) - sqrt
(d))/(sqrt(e*x + d) + sqrt(d)))/d^(3/2)) + b*integrate((log(c) + log(x^n))/
(sqrt(e*x + d)*x^2), x)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln(c\,x^n)}{x^2\,\sqrt{d+e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x)^(1/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x)^(1/2)), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\log(cx^n)}{x^2\sqrt{d+ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**2*sqrt(d + e*x)), x)
```

3.150 $\int \frac{a+b\log(cx^n)}{x^3\sqrt{d+ex}}\,dx$

Optimal. Leaf size=304

$$-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{4d^{5/2}}+\frac{3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{4d^2x}-\frac{\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{2dx^2}-\frac{3be^2n\mathrm{Li}_2\left(1-\cdots\right.}{4d^{5/2}}$$

```
[Out] 7/8*b*e^2*n*arctanh((e*x+d)^(1/2)/d^(1/2))/d^(5/2)+3/4*b*e^2*n*arctanh((e*x
+d)^(1/2)/d^(1/2))^2/d^(5/2)-3/4*e^2*arctanh((e*x+d)^(1/2)/d^(1/2))*(a+b*ln
(c*x^n))/d^(5/2)-3/2*b*e^2*n*arctanh((e*x+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d
^(1/2)-(e*x+d)^(1/2)))/d^(5/2)-3/4*b*e^2*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(
e*x+d)^(1/2)))/d^(5/2)-1/4*b*n*(e*x+d)^(1/2)/d/x^2+5/8*b*e*n*(e*x+d)^(1/2)/
d^2/x-1/2*(a+b*ln(c*x^n))*(e*x+d)^(1/2)/d/x^2+3/4*e*(a+b*ln(c*x^n))*(e*x+d)
^(1/2)/d^2/x
```

Rubi [A] time = 0.34, antiderivative size = 304, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {51, 63, 208, 2350, 12, 14, 47, 5984, 5918, 2402, 2315}

$$-\frac{3be^2n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{4d^{5/2}}-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{4d^{5/2}}+\frac{3e\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{4d^2x}-\sqrt{d+ex}\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*Sqrt[d + e*x]),x]
```

```
[Out] -(b*n*Sqrt[d + e*x])/(4*d*x^2) + (5*b*e*n*Sqrt[d + e*x])/(8*d^2*x) + (7*b*e
^2*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(8*d^(5/2)) + (3*b*e^2*n*ArcTanh[Sqrt[
d + e*x]/Sqrt[d]]^2)/(4*d^(5/2)) - (Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(2*d*
x^2) + (3*e*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(4*d^2*x) - (3*e^2*ArcTanh[Sq
rt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/(4*d^(5/2)) - (3*b*e^2*n*ArcTanh[S
qrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(2*d^(5/2
)) - (3*b*e^2*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(4*d
^(5/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
```

```
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\sqrt{d+ex}}\,dx = -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2} + \frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x} - \frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log}{4d^{5/2}}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2} + \frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x} - \frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log}{4d^{5/2}}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2} + \frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x} - \frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log}{4d^{5/2}}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2} + \frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x} - \frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log}{4d^{5/2}}$$

$$= -\frac{bn\sqrt{d+ex}}{4dx^2} + \frac{3ben\sqrt{d+ex}}{4d^2x} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2} + \frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x}$$

$$= -\frac{bn\sqrt{d+ex}}{4dx^2} + \frac{5ben\sqrt{d+ex}}{8d^2x} + \frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{5/2}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2} + \frac{3e}{}$$

$$= -\frac{bn\sqrt{d+ex}}{4dx^2} + \frac{5ben\sqrt{d+ex}}{8d^2x} + \frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4d^{5/2}} + \frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{5/2}} - \frac{\sqrt{d+}}{}$$

$$= -\frac{bn\sqrt{d+ex}}{4dx^2} + \frac{5ben\sqrt{d+ex}}{8d^2x} + \frac{7be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8d^{5/2}} + \frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{5/2}} - \frac{\sqrt{d+}}{}$$

$$= -\frac{bn\sqrt{d+ex}}{4dx^2} + \frac{5ben\sqrt{d+ex}}{8d^2x} + \frac{7be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8d^{5/2}} + \frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{5/2}} - \frac{\sqrt{d+}}{}$$

Mathematica [A] time = 0.43, size = 501, normalized size = 1.65

$$\frac{-8ad^{3/2}\sqrt{d+ex} + 6ae^2x^2\log\left(\sqrt{d}-\sqrt{d+ex}\right) - 6ae^2x^2\log\left(\sqrt{d+ex}+\sqrt{d}\right) + 12a\sqrt{d}\,ex\sqrt{d+ex} - 8bd^{3/2}\sqrt{d+}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*Sqrt[d + e*x]),x]
```

```
[Out] (-8*a*d^(3/2)*Sqrt[d + e*x] - 4*b*d^(3/2)*n*Sqrt[d + e*x] + 12*a*Sqrt[d]*e*
x*Sqrt[d + e*x] + 10*b*Sqrt[d]*e*n*x*Sqrt[d + e*x] + 14*b*e^2*n*x^2*ArcTanh
[Sqrt[d + e*x]/Sqrt[d]] - 8*b*d^(3/2)*Sqrt[d + e*x]*Log[c*x^n] + 12*b*Sqrt[
d]*e*x*Sqrt[d + e*x]*Log[c*x^n] + 6*a*e^2*x^2*Log[Sqrt[d] - Sqrt[d + e*x]]
+ 6*b*e^2*x^2*Log[c*x^n]*Log[Sqrt[d] - Sqrt[d + e*x]] - 3*b*e^2*n*x^2*Log[S
qrt[d] - Sqrt[d + e*x]]^2 - 6*a*e^2*x^2*Log[Sqrt[d] + Sqrt[d + e*x]] - 6*b*
e^2*x^2*Log[c*x^n]*Log[Sqrt[d] + Sqrt[d + e*x]] + 3*b*e^2*n*x^2*Log[Sqrt[d]
 + Sqrt[d + e*x]]^2 + 6*b*e^2*n*x^2*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1/2 -
Sqrt[d + e*x]/(2*Sqrt[d])] - 6*b*e^2*n*x^2*Log[Sqrt[d] - Sqrt[d + e*x]]*Log
```

```
[(1 + Sqrt[d + e*x]/Sqrt[d])/2] - 6*b*e^2*n*x^2*PolyLog[2, 1/2 - Sqrt[d + e
*x]/(2*Sqrt[d])] + 6*b*e^2*n*x^2*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2])
/(16*d^(5/2)*x^2)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex+d}\,b\log\left(cx^n\right)+\sqrt{ex+d}\,a}{ex^4+dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^(1/2),x, algorithm="fricas")
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/(e*x^4 + d*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\sqrt{ex+d}\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*x^3), x)
```

maple [F] time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right)+a}{\sqrt{ex+d}\;x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(e*x+d)^(1/2),x)
[Out] int((b*ln(c*x^n)+a)/x^3/(e*x+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{8}a\left(\frac{3\,e^2\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{d^{\frac{5}{2}}}+\frac{2\left(3\,(ex+d)^{\frac{3}{2}}e^2-5\,\sqrt{ex+d}\,de^2\right)}{(ex+d)^2d^2-2\,(ex+d)d^3+d^4}\right)+b\int \frac{\log(c)+\log\left(x^n\right)}{\sqrt{ex+d}\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^(1/2),x, algorithm="maxima")
[Out] 1/8*a*(3*e^2*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d)))/d^(5/
2) + 2*(3*(e*x + d)^(3/2)*e^2 - 5*sqrt(e*x + d)*d*e^2)/((e*x + d)^2*d^2 - 2
*(e*x + d)*d^3 + d^4)) + b*integrate((log(c) + log(x^n))/(sqrt(e*x + d)*x^3
), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,\sqrt{d+e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x)^(1/2)),x)
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\log(cx^n)}{x^3\sqrt{d + ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(e*x+d)**(1/2),x)
[Out] Integral((a + b*log(c*x**n))/(x**3*sqrt(d + e*x)), x)
```

3.151 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=194

$$\frac{2d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex}}+\frac{6d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{2d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(c\right.\right.}{5e^4}$$

```
[Out] 16/15*b*d*n*(e*x+d)^(3/2)/e^4-4/25*b*n*(e*x+d)^(5/2)/e^4+64/5*b*d^(5/2)*n*a
rctanh((e*x+d)^(1/2)/d^(1/2))/e^4-2*d*(e*x+d)^(3/2)*(a+b*ln(c*x^n))/e^4+2/5
*(e*x+d)^(5/2)*(a+b*ln(c*x^n))/e^4+2*d^3*(a+b*ln(c*x^n))/e^4/(e*x+d)^(1/2)-
44/5*b*d^2*n*(e*x+d)^(1/2)/e^4+6*d^2*(a+b*ln(c*x^n))*(e*x+d)^(1/2)/e^4
```

Rubi [A] time = 0.20, antiderivative size = 194, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {43, 2350, 12, 1620, 63, 208}

$$\frac{2d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex}}+\frac{6d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{2d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(c\right.\right.}{5e^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```

```
[Out] (-44*b*d^2*n*Sqrt[d + e*x])/(5*e^4) + (16*b*d*n*(d + e*x)^(3/2))/(15*e^4) -
 (4*b*n*(d + e*x)^(5/2))/(25*e^4) + (64*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/S
qrt[d]])/(5*e^4) + (2*d^3*(a + b*Log[c*x^n]))/(e^4*Sqrt[d + e*x]) + (6*d^2*
Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e^4 - (2*d*(d + e*x)^(3/2)*(a + b*Log[c*x
^n]))/e^4 + (2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
```

```
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^3 \left(a+b\log\left(cx^n\right)\right)}{(d+ex)^{3/2}}\,dx = \frac{2d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex}} + \frac{6d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4} - \frac{2d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}$$

$$= \frac{2d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex}} + \frac{6d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4} - \frac{2d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}$$

$$= \frac{2d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex}} + \frac{6d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4} - \frac{2d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}$$

$$= -\frac{44bd^2n\sqrt{d+ex}}{5e^4} + \frac{16bdn(d+ex)^{3/2}}{15e^4} - \frac{4bn(d+ex)^{5/2}}{25e^4} + \frac{2d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex}} + \frac{6d^2}{}$$

$$= -\frac{44bd^2n\sqrt{d+ex}}{5e^4} + \frac{16bdn(d+ex)^{3/2}}{15e^4} - \frac{4bn(d+ex)^{5/2}}{25e^4} + \frac{2d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex}} + \frac{6d^2}{}$$

$$= -\frac{44bd^2n\sqrt{d+ex}}{5e^4} + \frac{16bdn(d+ex)^{3/2}}{15e^4} - \frac{4bn(d+ex)^{5/2}}{25e^4} + \frac{64bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{5e^4} +$$

Mathematica [A] time = 0.13, size = 159, normalized size = 0.82

$$\frac{480ad^3+240ad^2ex-60ade^2x^2+30ae^3x^3+30b\left(16d^3+8d^2ex-2de^2x^2+e^3x^3\right)\log\left(cx^n\right)+960bd^{5/2}n\sqrt{d+ex}\,\mathrm{ta}}{75e^4\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```

```
[Out] (480*a*d^3 - 592*b*d^3*n + 240*a*d^2*e*x - 536*b*d^2*e*n*x - 60*a*d*e^2*x^2
 + 44*b*d*e^2*n*x^2 + 30*a*e^3*x^3 - 12*b*e^3*n*x^3 + 960*b*d^(5/2)*n*Sqrt[
d + e*x]*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 30*b*(16*d^3 + 8*d^2*e*x - 2*d*e^
2*x^2 + e^3*x^3)*Log[c*x^n])/(75*e^4*Sqrt[d + e*x])
```

fricas [A] time = 0.50, size = 435, normalized size = 2.24

$$\left[\frac{2\left(240\left(bd^2enx+bd^3n\right)\sqrt{d}\,\log\left(\frac{ex+2\,\sqrt{ex+d}\,\sqrt{d}+2\,d}{x}\right)-\left(296\,bd^3n-240\,ad^3+3\left(2\,be^3n-5\,ae^3\right)x^3-2\left(11\,bde^2n-1\right.\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [2/75*(240*(b*d^2*e*n*x + b*d^3*n)*sqrt(d)*log((e*x + 2*sqrt(e*x + d)*sqrt(
d) + 2*d)/x) - (296*b*d^3*n - 240*a*d^3 + 3*(2*b*e^3*n - 5*a*e^3)*x^3 - 2*(
11*b*d*e^2*n - 15*a*d*e^2)*x^2 + 4*(67*b*d^2*e*n - 30*a*d^2*e)*x - 15*(b*e^
3*x^3 - 2*b*d*e^2*x^2 + 8*b*d^2*e*x + 16*b*d^3)*log(c) - 15*(b*e^3*n*x^3 -
2*b*d*e^2*n*x^2 + 8*b*d^2*e*n*x + 16*b*d^3*n)*log(x))*sqrt(e*x + d))/(e^5*x
 + d*e^4), -2/75*(480*(b*d^2*e*n*x + b*d^3*n)*sqrt(-d)*arctan(sqrt(e*x + d)
*sqrt(-d)/d) + (296*b*d^3*n - 240*a*d^3 + 3*(2*b*e^3*n - 5*a*e^3)*x^3 - 2*(
11*b*d*e^2*n - 15*a*d*e^2)*x^2 + 4*(67*b*d^2*e*n - 30*a*d^2*e)*x - 15*(b*e^
3*x^3 - 2*b*d*e^2*x^2 + 8*b*d^2*e*x + 16*b*d^3)*log(c) - 15*(b*e^3*n*x^3 -
2*b*d*e^2*n*x^2 + 8*b*d^2*e*n*x + 16*b*d^3*n)*log(x))*sqrt(e*x + d))/(e^5*x
 + d*e^4)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log\left(cx^{n}\right) + a\right)x^{3}}{\left(ex + d\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x + d)^(3/2), x)
```

maple [F] time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{\left(b \ln\left(c\,x^{n}\right) + a\right)x^{3}}{\left(ex + d\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(e*x+d)^(3/2),x)
```

```
[Out] int(x^3*(b*ln(c*x^n)+a)/(e*x+d)^(3/2),x)
```

maxima [A] time = 1.26, size = 200, normalized size = 1.03

$$-\frac{4}{75}\,bn\left(\frac{120\,d^{\frac{5}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^{4}} + \frac{3\,(ex+d)^{\frac{5}{2}} - 20\,(ex+d)^{\frac{3}{2}}d + 165\,\sqrt{ex+d}\,d^{2}}{e^{4}}\right) + \frac{2}{5}\,b\left(\frac{(ex+d)^{\frac{5}{2}}}{e^{4}} - \frac{5\,(ex+d)^{\frac{3}{2}}}{e^{4}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -4/75*b*n*(120*d^(5/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(
d)))/e^4 + (3*(e*x + d)^(5/2) - 20*(e*x + d)^(3/2)*d + 165*sqrt(e*x + d)*d^
2)/e^4) + 2/5*b*((e*x + d)^(5/2)/e^4 - 5*(e*x + d)^(3/2)*d/e^4 + 15*sqrt(e*
x + d)*d^2/e^4 + 5*d^3/(sqrt(e*x + d)*e^4))*log(c*x^n) + 2/5*a*((e*x + d)^(
5/2)/e^4 - 5*(e*x + d)^(3/2)*d/e^4 + 15*sqrt(e*x + d)*d^2/e^4 + 5*d^3/(sqrt
(e*x + d)*e^4))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(d+e\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x)^(3/2),x)
```

```
[Out] int((x^3*(a + b*log(c*x^n)))/(d + e*x)^(3/2), x)
```

sympy [A] time = 56.70, size = 384, normalized size = 1.98

$$\frac{2ad^3}{\sqrt{d+ex}} + 6ad^2\sqrt{d+ex} - 2ad\,(d+ex)^{\frac{3}{2}} + \frac{2a(d+ex)^{\frac{5}{2}}}{5} - 2bd^3\left(\frac{2n\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}} - \frac{\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{\sqrt{d+ex}}\right) + 6bd^2\left(\sqrt{d+ex}\,\log\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x+d)**(3/2),x)
```

```
[Out] (2*a*d**3/sqrt(d + e*x) + 6*a*d**2*sqrt(d + e*x) - 2*a*d*(d + e*x)**(3/2) +
 2*a*(d + e*x)**(5/2)/5 - 2*b*d**3*(2*n*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-
d) - log(c*(-d/e + (d + e*x)/e)**n)/sqrt(d + e*x)) + 6*b*d**2*(sqrt(d + e*x
)*log(c*(-d/e + (d + e*x)/e)**n) - 2*n*(d*e*atan(sqrt(d + e*x)/sqrt(-d))/sq
rt(-d) + e*sqrt(d + e*x))/e) - 6*b*d*((d + e*x)**(3/2)*log(c*(-d/e + (d + e
*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt
(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)) + 2*b*((d + e*x)**(5/2)*log(c*(-d/
e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d)
+ d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(d + e*x)**(5/2)/5)/(5*
e)))/e**4
```

3.152 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=146

$$-\frac{2d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex}}-\frac{4d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}-\frac{32bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^3}$$

```
[Out] -4/9*b*n*(e*x+d)^(3/2)/e^3-32/3*b*d^(3/2)*n*arctanh((e*x+d)^(1/2)/d^(1/2))/
e^3+2/3*(e*x+d)^(3/2)*(a+b*ln(c*x^n))/e^3-2*d^2*(a+b*ln(c*x^n))/e^3/(e*x+d)
^(1/2)+20/3*b*d*n*(e*x+d)^(1/2)/e^3-4*d*(a+b*ln(c*x^n))*(e*x+d)^(1/2)/e^3
```

Rubi [A] time = 0.16, antiderivative size = 146, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {43, 2350, 12, 897, 1153, 208}

$$-\frac{2d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex}}-\frac{4d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}-\frac{32bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```

```
[Out] (20*b*d*n*Sqrt[d + e*x])/(3*e^3) - (4*b*n*(d + e*x)^(3/2))/(9*e^3) - (32*b*
d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(3*e^3) - (2*d^2*(a + b*Log[c*x^n
]))/(e^3*Sqrt[d + e*x]) - (4*d*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e^3 + (2*(
d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
```

```
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^{3/2}}\,dx = -\frac{2d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex}} - \frac{4d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3} + \frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}$$

$$= -\frac{2d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex}} - \frac{4d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3} + \frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}$$

$$= -\frac{2d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex}} - \frac{4d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3} + \frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}$$

$$= -\frac{2d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex}} - \frac{4d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3} + \frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}$$

$$= \frac{20bdn\sqrt{d+ex}}{3e^3} - \frac{4bn(d+ex)^{3/2}}{9e^3} - \frac{2d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex}} - \frac{4d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3}$$

$$= \frac{20bdn\sqrt{d+ex}}{3e^3} - \frac{4bn(d+ex)^{3/2}}{9e^3} - \frac{32bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^3} - \frac{2d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex}}$$

Mathematica [A] time = 0.10, size = 124, normalized size = 0.85

$$\frac{-48ad^2-24adex+6ae^2x^2-6b\left(8d^2+4dex-e^2x^2\right)\log\left(cx^n\right)-96bd^{3/2}n\sqrt{d+ex}\,\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)+56bd^2n+52}{9e^3\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```

```
[Out] (-48*a*d^2 + 56*b*d^2*n - 24*a*d*e*x + 52*b*d*e*n*x + 6*a*e^2*x^2 - 4*b*e^2
*n*x^2 - 96*b*d^(3/2)*n*Sqrt[d + e*x]*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] - 6*b*
(8*d^2 + 4*d*e*x - e^2*x^2)*Log[c*x^n])/(9*e^3*Sqrt[d + e*x])
```

fricas [A] time = 0.58, size = 330, normalized size = 2.26

$$\left[\frac{2\left(24\left(bdenx+bd^2n\right)\sqrt{d}\,\log\left(\frac{ex-2\sqrt{ex+d}\sqrt{d}+2d}{x}\right)+\left(28bd^2n-24ad^2-\left(2be^2n-3ae^2\right)x^2+2\left(13bden-6ade\right)x\right.\right.}{9\left(e^4x+de^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [2/9*(24*(b*d*e*n*x + b*d^2*n)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) +
 2*d)/x) + (28*b*d^2*n - 24*a*d^2 - (2*b*e^2*n - 3*a*e^2)*x^2 + 2*(13*b*d*e
*n - 6*a*d*e)*x + 3*(b*e^2*x^2 - 4*b*d*e*x - 8*b*d^2)*log(c) + 3*(b*e^2*n*x
^2 - 4*b*d*e*n*x - 8*b*d^2*n)*log(x))*sqrt(e*x + d))/(e^4*x + d*e^3), 2/9*(
48*(b*d*e*n*x + b*d^2*n)*sqrt(-d)*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (28*b*
d^2*n - 24*a*d^2 - (2*b*e^2*n - 3*a*e^2)*x^2 + 2*(13*b*d*e*n - 6*a*d*e)*x +
 3*(b*e^2*x^2 - 4*b*d*e*x - 8*b*d^2)*log(c) + 3*(b*e^2*n*x^2 - 4*b*d*e*n*x
- 8*b*d^2*n)*log(x))*sqrt(e*x + d))/(e^4*x + d*e^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^2}{(ex+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x + d)^(3/2), x)
```

maple [F] time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n)+a)\,x^2}{(ex+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(e*x+d)^(3/2),x)
```

```
[Out] int(x^2*(b*ln(c*x^n)+a)/(e*x+d)^(3/2),x)
```

maxima [A] time = 1.45, size = 157, normalized size = 1.08

$$\frac{4}{9}\,bn\left(\frac{12\,d^{\frac{3}{2}}\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^3}-\frac{(ex+d)^{\frac{3}{2}}-15\,\sqrt{ex+d}\,d}{e^3}\right)+\frac{2}{3}\,b\left(\frac{(ex+d)^{\frac{3}{2}}}{e^3}-\frac{6\,\sqrt{ex+d}\,d}{e^3}-\frac{3\,d^2}{\sqrt{ex+d}\,e^3}\right)\log\left(cx^n\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] 4/9*b*n*(12*d^(3/2)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d))
)/e^3 - ((e*x + d)^(3/2) - 15*sqrt(e*x + d)*d)/e^3) + 2/3*b*((e*x + d)^(3/2
)/e^3 - 6*sqrt(e*x + d)*d/e^3 - 3*d^2/(sqrt(e*x + d)*e^3))*log(c*x^n) + 2/3
*a*((e*x + d)^(3/2)/e^3 - 6*sqrt(e*x + d)*d/e^3 - 3*d^2/(sqrt(e*x + d)*e^3)
)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(d+e\,x\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e*x)^(3/2),x)
```

```
[Out] int((x^2*(a + b*log(c*x^n)))/(d + e*x)^(3/2), x)
```

sympy [A] time = 39.95, size = 262, normalized size = 1.79

$$\frac{-\frac{2ad^2}{\sqrt{d+ex}} - 4ad\sqrt{d+ex} + \frac{2a(d+ex)^{\frac{3}{2}}}{3} + 2bd^2\left(\frac{2n\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}} - \frac{\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{\sqrt{d+ex}}\right) - 4bd\left(\sqrt{d+ex}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)\right.}{e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x+d)**(3/2),x)
```

```
[Out] (-2*a*d**2/sqrt(d + e*x) - 4*a*d*sqrt(d + e*x) + 2*a*(d + e*x)**(3/2)/3 + 2
*b*d**2*(2*n*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) - log(c*(-d/e + (d + e*x
)/e)**n)/sqrt(d + e*x)) - 4*b*d*(sqrt(d + e*x)*log(c*(-d/e + (d + e*x)/e)**
n) - 2*n*(d*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + e*sqrt(d + e*x))/e) +
 2*b*((d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(
sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3
)/(3*e)))/e**3
```

3.153 $\int \frac{x(a+b\log(cx^n))}{(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=94

$$\frac{2\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex}}-\frac{4bn\sqrt{d+ex}}{e^2}+\frac{8b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e^2}$$

```
[Out] 8*b*n*arctanh((e*x+d)^(1/2)/d^(1/2))*d^(1/2)/e^2+2*d*(a+b*ln(c*x^n))/e^2/(e
*x+d)^(1/2)-4*b*n*(e*x+d)^(1/2)/e^2+2*(a+b*ln(c*x^n))*(e*x+d)^(1/2)/e^2
```

Rubi [A] time = 0.09, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {43, 2350, 12, 80, 63, 208}

$$\frac{2\sqrt{d+ex}\,\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex}}-\frac{4bn\sqrt{d+ex}}{e^2}+\frac{8b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```

```
[Out] (-4*b*n*Sqrt[d + e*x])/e^2 + (8*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])
/e^2 + (2*d*(a + b*Log[c*x^n]))/(e^2*Sqrt[d + e*x]) + (2*Sqrt[d + e*x]*(a +
 b*Log[c*x^n]))/e^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^{3/2}}\,dx = \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex}} + \frac{2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2} - (bn)\int \frac{2(2d+ex)}{e^2x\sqrt{d+ex}}\,dx$$

$$= \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex}} + \frac{2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2} - \frac{(2bn)\int \frac{2d+ex}{x\sqrt{d+ex}}\,dx}{e^2}$$

$$= -\frac{4bn\sqrt{d+ex}}{e^2} + \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex}} + \frac{2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2} - \frac{(4bdn)\int \frac{1}{x\sqrt{d+ex}}}{e^2}$$

$$= -\frac{4bn\sqrt{d+ex}}{e^2} + \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex}} + \frac{2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2} - \frac{(8bdn)\,\mathrm{Subst}\Big(\int}{}$$

$$= -\frac{4bn\sqrt{d+ex}}{e^2} + \frac{8b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e^2} + \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex}} + \frac{2\sqrt{d+ex}\left(a+b\log\right.}{e^2}$$

Mathematica [A] time = 0.07, size = 83, normalized size = 0.88

$$\frac{2\left(2ad+aex+b(2d+ex)\log\left(cx^n\right)+4b\sqrt{d}\,n\sqrt{d+ex}\,\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)-2bdn-2benx\right)}{e^2\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```

```
[Out] (2*(2*a*d - 2*b*d*n + a*e*x - 2*b*e*n*x + 4*b*Sqrt[d]*n*Sqrt[d + e*x]*ArcTa
nh[Sqrt[d + e*x]/Sqrt[d]] + b*(2*d + e*x)*Log[c*x^n]))/(e^2*Sqrt[d + e*x])
```

fricas [A] time = 0.61, size = 223, normalized size = 2.37

$$\left[\frac{2\left(2\left(benx+bdn\right)\sqrt{d}\,\log\left(\frac{ex+2\sqrt{ex+d}\sqrt{d}+2d}{x}\right)-\left(2bdn-2ad+(2ben-ae)x-(bex+2bd)\log(c)-(benx+2bd\right.\right.}{e^3x+de^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [2*(2*(b*e*n*x + b*d*n)*sqrt(d)*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x
) - (2*b*d*n - 2*a*d + (2*b*e*n - a*e)*x - (b*e*x + 2*b*d)*log(c) - (b*e*n*
x + 2*b*d*n)*log(x))*sqrt(e*x + d))/(e^3*x + d*e^2), -2*(4*(b*e*n*x + b*d*n
)*sqrt(-d)*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (2*b*d*n - 2*a*d + (2*b*e*n -
 a*e)*x - (b*e*x + 2*b*d)*log(c) - (b*e*n*x + 2*b*d*n)*log(x))*sqrt(e*x + d
))/(e^3*x + d*e^2)]
```

giac [A] time = 0.34, size = 105, normalized size = 1.12

$$-\frac{8\,bdn\arctan\left(\frac{\sqrt{xe+d}}{\sqrt{-d}}\right)e^{(-2)}}{\sqrt{-d}}+\frac{2\left((xe+d)bn\log\left(xe\right)+bdn\log\left(xe\right)-3\left(xe+d\right)bn-bdn+(xe+d)b\log(c)+b\right.}{\sqrt{xe+d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] -8*b*d*n*arctan(sqrt(x*e + d)/sqrt(-d))*e^(-2)/sqrt(-d) + 2*((x*e + d)*b*n*
log(x*e) + b*d*n*log(x*e) - 3*(x*e + d)*b*n - b*d*n + (x*e + d)*b*log(c) +
b*d*log(c) + (x*e + d)*a + a*d)*e^(-2)/sqrt(x*e + d)
```

maple [F] time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^{n}\right)+a\right)x}{\left(ex+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x+d)^(3/2),x)
```

```
[Out] int(x*(b*ln(c*x^n)+a)/(e*x+d)^(3/2),x)
```

maxima [A] time = 1.42, size = 112, normalized size = 1.19

$$-4\,bn\left(\frac{\sqrt{d}\,\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{e^{2}}+\frac{\sqrt{ex+d}}{e^{2}}\right)+2\,b\left(\frac{\sqrt{ex+d}}{e^{2}}+\frac{d}{\sqrt{ex+d}\,e^{2}}\right)\log\left(cx^{n}\right)+2\,a\left(\frac{\sqrt{ex+d}}{e^{2}}+\frac{d}{\sqrt{ex+d}\,e^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -4*b*n*(sqrt(d)*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d)))/e^
2 + sqrt(e*x + d)/e^2) + 2*b*(sqrt(e*x + d)/e^2 + d/(sqrt(e*x + d)*e^2))*lo
g(c*x^n) + 2*a*(sqrt(e*x + d)/e^2 + d/(sqrt(e*x + d)*e^2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(d+e\,x\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x)^(3/2),x)
```

```
[Out] int((x*(a + b*log(c*x^n)))/(d + e*x)^(3/2), x)
```

sympy [A] time = 58.82, size = 153, normalized size = 1.63

$$\frac{\frac{2ad}{\sqrt{d+ex}}+2a\sqrt{d+ex}-2bd\left(\frac{2n\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}-\frac{\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^{n}\right)}{\sqrt{d+ex}}\right)+2b\left(\sqrt{d+ex}\,\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^{n}\right)-\frac{2n\left(\frac{de\operatorname{atan}\left(\frac{\sqrt{d}}{\sqrt{}}\right.}{\sqrt{-d}}\right.}{}\right.}{e^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x+d)**(3/2),x)
```

```
[Out] (2*a*d/sqrt(d + e*x) + 2*a*sqrt(d + e*x) - 2*b*d*(2*n*atan(sqrt(d + e*x)/sq
rt(-d))/sqrt(-d) - log(c*(-d/e + (d + e*x)/e)**n)/sqrt(d + e*x)) + 2*b*(sqr
t(d + e*x)*log(c*(-d/e + (d + e*x)/e)**n) - 2*n*(d*e*atan(sqrt(d + e*x)/sqr
t(-d))/sqrt(-d) + e*sqrt(d + e*x))/e))/e**2
```

3.154 $\int \frac{a+b\log(cx^n)}{(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=53

$$-\frac{2\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d+ex}}-\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}\,e}$$

```
[Out] -4*b*n*arctanh((e*x+d)^(1/2)/d^(1/2))/e/d^(1/2)-2*(a+b*ln(c*x^n))/e/(e*x+d)
^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {2319, 63, 208}

$$-\frac{2\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d+ex}}-\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}\,e}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x)^(3/2),x]
```

```
[Out] (-4*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(Sqrt[d]*e) - (2*(a + b*Log[c*x^n])
)/(e*Sqrt[d + e*x])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] && !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex)^{3/2}}\,dx = -\frac{2\left(a+b\log(cx^n)\right)}{e\sqrt{d+ex}} + \frac{(2bn)\int \frac{1}{x\sqrt{d+ex}}\,dx}{e}$$

$$= -\frac{2\left(a+b\log(cx^n)\right)}{e\sqrt{d+ex}} + \frac{(4bn)\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx, x, \sqrt{d+ex}\right)}{e^2}$$

$$= -\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}\,e} - \frac{2\left(a+b\log(cx^n)\right)}{e\sqrt{d+ex}}$$

Mathematica [A] time = 0.04, size = 53, normalized size = 1.00

$$-\frac{2\left(a+b\log(cx^n)\right)}{e\sqrt{d+ex}} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}\,e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x)^(3/2),x]
```

```
[Out] (-4*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(Sqrt[d]*e) - (2*(a + b*Log[c*x^n])
)/(e*Sqrt[d + e*x])
```

fricas [A] time = 0.64, size = 155, normalized size = 2.92

$$\left[\frac{2\left((benx+bdn)\sqrt{d}\,\log\left(\frac{ex-2\sqrt{ex+d}\sqrt{d}+2d}{x}\right)-\left(bdn\log(x)+bd\log(c)+ad\right)\sqrt{ex+d}\right)}{de^2x+d^2e}, \frac{2\left(2(benx+bdn)\sqrt{-d}\,\text{arc}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [2*((b*e*n*x + b*d*n)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x)
- (b*d*n*log(x) + b*d*log(c) + a*d)*sqrt(e*x + d))/(d*e^2*x + d^2*e), 2*(2*
(b*e*n*x + b*d*n)*sqrt(-d)*arctan(sqrt(e*x + d)*sqrt(-d)/d) - (b*d*n*log(x)
 + b*d*log(c) + a*d)*sqrt(e*x + d))/(d*e^2*x + d^2*e)]
```

giac [A] time = 0.34, size = 57, normalized size = 1.08

$$\frac{4\,bn\arctan\left(\frac{\sqrt{xe+d}}{\sqrt{-d}}\right)e^{(-1)}}{\sqrt{-d}} - \frac{2\left(bn\log(xe)-bn+b\log(c)+a\right)e^{(-1)}}{\sqrt{xe+d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] 4*b*n*arctan(sqrt(x*e + d)/sqrt(-d))*e^(-1)/sqrt(-d) - 2*(b*n*log(x*e) - b*
n + b*log(c) + a)*e^(-1)/sqrt(x*e + d)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{b\ln(c\,x^n)+a}{(ex+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x+d)^(3/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/(e*x+d)^(3/2),x)
```

maxima [A] time = 1.56, size = 71, normalized size = 1.34

$$\frac{2\,bn\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{\sqrt{d}\,e}-\frac{2\,b\log\left(cx^{n}\right)}{\sqrt{ex+d}\,e}-\frac{2\,a}{\sqrt{ex+d}\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] 2*b*n*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d)))/(sqrt(d)*e)
- 2*b*log(c*x^n)/(sqrt(e*x + d)*e) - 2*a/(sqrt(e*x + d)*e)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{\left(d+e\,x\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x)^(3/2),x)
```

```
[Out] int((a + b*log(c*x^n))/(d + e*x)^(3/2), x)
```

sympy [A] time = 13.89, size = 66, normalized size = 1.25

$$\frac{-\frac{2a}{\sqrt{d+ex}}+2b\left(\frac{2n\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}-\frac{\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^{n}\right)}{\sqrt{d+ex}}\right)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x+d)**(3/2),x)
```

```
[Out] (-2*a/sqrt(d + e*x) + 2*b*(2*n*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) - log(
c*(-d/e + (d + e*x)/e)**n)/sqrt(d + e*x)))/e
```

3.155 $\int \frac{a+b\log(cx^n)}{x(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=201

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{d^{3/2}}+\frac{2\left(a+b\log\left(cx^n\right)\right)}{d\sqrt{d+ex}}-\frac{2bn\mathrm{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{3/2}}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}}+\frac{4bn\,\mathrm{ta}}{}$$

```
[Out] 4*b*n*arctanh((e*x+d)^(1/2)/d^(1/2))/d^(3/2)+2*b*n*arctanh((e*x+d)^(1/2)/d^
(1/2))^2/d^(3/2)-2*arctanh((e*x+d)^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/d^(3/2)-4
*b*n*arctanh((e*x+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))/d
^(3/2)-2*b*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))/d^(3/2)+2*(a+b*
ln(c*x^n))/d/(e*x+d)^(1/2)
```

Rubi [A] time = 0.32, antiderivative size = 201, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2347, 63, 208, 2348, 12, 5984, 5918, 2402, 2315, 2319}

$$-\frac{2bn\,\mathrm{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{3/2}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{d^{3/2}}+\frac{2\left(a+b\log\left(cx^n\right)\right)}{d\sqrt{d+ex}}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x)^(3/2)),x]
```

```
[Out] (4*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(3/2) + (2*b*n*ArcTanh[Sqrt[d + e*
x]/Sqrt[d]]^2)/d^(3/2) + (2*(a + b*Log[c*x^n]))/(d*Sqrt[d + e*x]) - (2*ArcT
anh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/d^(3/2) - (4*b*n*ArcTanh[Sqr
t[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/d^(3/2) - (
2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/d^(3/2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
```

```
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex)^{3/2}}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex}}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^{3/2}}\,dx}{d}$$

$$= \frac{2\left(a+b\log(cx^n)\right)}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{3/2}} - \frac{(bn)\int -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}\,x}\,dx}{d} - \frac{(2}{}$$

$$= \frac{2\left(a+b\log(cx^n)\right)}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{3/2}} + \frac{(2bn)\int \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}\,dx}{d^{3/2}} - \frac{(4b}{}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{2\left(a+b\log(cx^n)\right)}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{3/2}} + \frac{(4bn)\,\mathrm{S}}{}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} + \frac{2\left(a+b\log(cx^n)\right)}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a\right.}{d^{3/2}}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} + \frac{2\left(a+b\log(cx^n)\right)}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a\right.}{d^{3/2}}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} + \frac{2\left(a+b\log(cx^n)\right)}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a\right.}{d^{3/2}}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} + \frac{2\left(a+b\log(cx^n)\right)}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a\right.}{d^{3/2}}$$

Mathematica [A] time = 0.28, size = 295, normalized size = 1.47

$$\frac{\frac{4\sqrt{d}\left(a+b\log(cx^n)\right)}{\sqrt{d+ex}} + 2\log\left(\sqrt{d}-\sqrt{d+ex}\right)\left(a+b\log(cx^n)\right) - 2\log\left(\sqrt{d+ex}+\sqrt{d}\right)\left(a+b\log(cx^n)\right) - bn\left(2\mathrm{Li}_2\left(\frac{1}{2}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x)^(3/2)),x]
```

```
[Out] (8*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + (4*Sqrt[d]*(a + b*Log[c*x^n]))/Sqrt
[d + e*x] + 2*(a + b*Log[c*x^n])*Log[Sqrt[d] - Sqrt[d + e*x]] - 2*(a + b*Lo
g[c*x^n])*Log[Sqrt[d] + Sqrt[d + e*x]] - b*n*(Log[Sqrt[d] - Sqrt[d + e*x]]*
(Log[Sqrt[d] - Sqrt[d + e*x]] + 2*Log[(1 + Sqrt[d + e*x]/Sqrt[d])/2]) + 2*P
olyLog[2, 1/2 - Sqrt[d + e*x]/(2*Sqrt[d])]) + b*n*(Log[Sqrt[d] + Sqrt[d + e
*x]]*(Log[Sqrt[d] + Sqrt[d + e*x]] + 2*Log[1/2 - Sqrt[d + e*x]/(2*Sqrt[d])]
) + 2*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2]))/(2*d^(3/2))
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{ex+d}\,b\log(cx^n)+\sqrt{ex+d}\,a}{e^2x^3+2\,dex^2+d^2x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/(e^2*x^3 + 2*d*e*x^
2 + d^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b \log\left(cx^{n}\right) + a}{(ex + d)^{\frac{3}{2}} x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^(3/2)*x), x)
```

maple [F] time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{b \ln\left(c\, x^{n}\right) + a}{(ex + d)^{\frac{3}{2}}\, x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x+d)^(3/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x/(e*x+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{d^{\frac{3}{2}}} + \frac{2}{\sqrt{ex + d}\, d}\right) + b\int \frac{\log(c) + \log\left(x^{n}\right)}{\left(ex^{2} + dx\right)\sqrt{ex + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] a*(log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d)))/d^(3/2) + 2/(sq
rt(e*x + d)*d)) + b*integrate((log(c) + log(x^n))/((e*x^2 + d*x)*sqrt(e*x +
 d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b\, \ln\left(c\, x^{n}\right)}{x\, (d + e\, x)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x)^(3/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x+d)**(3/2),x)
```

```
[Out] Timed out
```

3.156 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=253

$$\frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{d^{5/2}}-\frac{3e\left(a+b\log\left(cx^n\right)\right)}{d^2\sqrt{d+ex}}-\frac{a+b\log\left(cx^n\right)}{dx\sqrt{d+ex}}+\frac{3ben\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{5/2}}-\frac{3ben\tanh^{-}}{d^{5}}$$

```
[Out] -5*b*e*n*arctanh((e*x+d)^(1/2)/d^(1/2))/d^(5/2)-3*b*e*n*arctanh((e*x+d)^(1/
2)/d^(1/2))^2/d^(5/2)+3*e*arctanh((e*x+d)^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/d^
(5/2)+6*b*e*n*arctanh((e*x+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(1/2)-(e*x+d)^
(1/2)))/d^(5/2)+3*b*e*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(e*x+d)^(1/2)))/d^(5
/2)-3*e*(a+b*ln(c*x^n))/d^2/(e*x+d)^(1/2)+(-a-b*ln(c*x^n))/d/x/(e*x+d)^(1/2
)-b*n*(e*x+d)^(1/2)/d^2/x
```

Rubi [A] time = 0.52, antiderivative size = 255, normalized size of antiderivative = 1.01, number of steps used = 15, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {51, 63, 208, 2350, 12, 14, 47, 50, 5984, 5918, 2402, 2315}

$$\frac{3ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{5/2}}-\frac{3\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{d^2x}+\frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{d^{5/2}}+\frac{2\left(a+b\log\right.}{dx\sqrt{d+}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x)^(3/2)),x]
```

```
[Out] -((b*n*Sqrt[d + e*x])/(d^2*x)) - (5*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d
^(5/2) - (3*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/d^(5/2) + (2*(a + b*Log
[c*x^n]))/(d*x*Sqrt[d + e*x]) - (3*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(d^2*x
) + (3*e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/d^(5/2) + (6*b*
e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x]
)])/d^(5/2) + (3*b*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])
])/d^(5/2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
```

```
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
```

```
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex)^{3/2}}\,dx = \frac{2\left(a+b\log(cx^n)\right)}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{d^2x} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{5/2}} -$$

$$= \frac{2\left(a+b\log(cx^n)\right)}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{d^2x} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{5/2}} -$$

$$= \frac{2\left(a+b\log(cx^n)\right)}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{d^2x} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{5/2}} -$$

$$= -\frac{4ben\sqrt{d+ex}}{d^3} + \frac{2\left(a+b\log(cx^n)\right)}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{d^2x} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(}{d^{5/2}}$$

$$= -\frac{bn\sqrt{d+ex}}{d^2x} + \frac{2\left(a+b\log(cx^n)\right)}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{d^2x} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a}{d^{5/2}}$$

$$= -\frac{bn\sqrt{d+ex}}{d^2x} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{5/2}} + \frac{2\left(a+b\log(cx^n)\right)}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\left(a+b\log(cx^n)\right)}{d^2x}$$

$$= -\frac{bn\sqrt{d+ex}}{d^2x} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{5/2}} + \frac{2\left(a+b\log(cx^n)\right)}{dx\sqrt{d+ex}} - 3\sqrt{}$$

$$= -\frac{bn\sqrt{d+ex}}{d^2x} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{5/2}} + \frac{2\left(a+b\log(cx^n)\right)}{dx\sqrt{d+ex}} - 3\sqrt{}$$

$$= -\frac{bn\sqrt{d+ex}}{d^2x} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{5/2}} + \frac{2\left(a+b\log(cx^n)\right)}{dx\sqrt{d+ex}} - 3\sqrt{}$$

Mathematica [A] time = 0.49, size = 506, normalized size = 2.00

$$2e\left(-\frac{3\log\left(\sqrt{d}-\sqrt{d+ex}\right)\left(a+b\log(cx^n)\right)}{4d^{5/2}} + \frac{3\log\left(\sqrt{d+ex}+\sqrt{d}\right)\left(a+b\log(cx^n)\right)}{4d^{5/2}} - \frac{a+b\log(cx^n)}{d^2\sqrt{d+ex}} + \frac{a}{4d^2(}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x)^(3/2)),x]
```

```
[Out] 2*e*((-2*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(5/2) + (b*n*((Sqrt[d] - Sqr
t[d + e*x])^(-1) - ArcTanh[Sqrt[d + e*x]/Sqrt[d]]/Sqrt[d]))/(4*d^2) - (b*n*
((Sqrt[d] + Sqrt[d + e*x])^(-1) + ArcTanh[Sqrt[d + e*x]/Sqrt[d]]/Sqrt[d]))/
(4*d^2) - (a + b*Log[c*x^n])/(d^2*Sqrt[d + e*x]) + (a + b*Log[c*x^n])/(4*d^
2*(Sqrt[d] - Sqrt[d + e*x])) - (a + b*Log[c*x^n])/(4*d^2*(Sqrt[d] + Sqrt[d
+ e*x])) - (3*(a + b*Log[c*x^n])*Log[Sqrt[d] - Sqrt[d + e*x]])/(4*d^(5/2))
+ (3*(a + b*Log[c*x^n])*Log[Sqrt[d] + Sqrt[d + e*x]])/(4*d^(5/2)) + (3*b*n*
(Log[Sqrt[d] - Sqrt[d + e*x]]^2 + 2*Log[Sqrt[d] - Sqrt[d + e*x]]*Log[(Sqrt[
d] + Sqrt[d + e*x])/(2*Sqrt[d])] + 2*PolyLog[2, (Sqrt[d] - Sqrt[d + e*x])/(
2*Sqrt[d])]))/(8*d^(5/2)) - (3*b*n*(2*Log[(Sqrt[d] - Sqrt[d + e*x])/(2*Sqrt
[d])]*Log[Sqrt[d] + Sqrt[d + e*x]] + Log[Sqrt[d] + Sqrt[d + e*x]]^2 + 2*Pol
yLog[2, (Sqrt[d] + Sqrt[d + e*x])/(2*Sqrt[d])]))/(8*d^(5/2)))
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex+d}\,b\log\left(cx^n\right)+\sqrt{ex+d}\,a}{e^2x^4+2\,dex^3+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/(e^2*x^4 + 2*d*e*x^
3 + d^2*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{(ex+d)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^(3/2)*x^2), x)
```

maple [F] time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right)+a}{(ex+d)^{\frac{3}{2}}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(e*x+d)^(3/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^2/(e*x+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a\left(\frac{2\,(3\,(ex+d)e-2\,de)}{(ex+d)^{\frac{3}{2}}d^2-\sqrt{ex+d}\,d^3}+\frac{3\,e\log\left(\frac{\sqrt{ex+d}-\sqrt{d}}{\sqrt{ex+d}+\sqrt{d}}\right)}{d^{\frac{5}{2}}}\right)+b\int \frac{\log(c)+\log\left(x^n\right)}{\left(ex^3+dx^2\right)\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2*a*(2*(3*(e*x + d)*e - 2*d*e)/((e*x + d)^(3/2)*d^2 - sqrt(e*x + d)*d^3)
 + 3*e*log((sqrt(e*x + d) - sqrt(d))/(sqrt(e*x + d) + sqrt(d)))/d^(5/2)) +
b*integrate((log(c) + log(x^n))/((e*x^3 + d*x^2)*sqrt(e*x + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^2\,{\left(d+e\,x\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x)^(3/2)),x)
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x+d)**(3/2),x)
[Out] Integral((a + b*log(c*x**n))/(x**2*(d + e*x)**(3/2)), x)
```

3.157 $\int \frac{x^2}{(d+ex)(a+b\log(cx^n))}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{x^2}{(d+ex)\left(a+b\log\left(cx^n\right)\right)},x\right)$$

```
[Out] Unintegrable(x^2/(e*x+d)/(a+b*ln(c*x^n)),x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((d + e*x)*(a + b*Log[c*x^n])),x]
[Out] Defer[Int][x^2/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{x^2}{(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx=\int \frac{x^2}{(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Mathematica [A] time = 1.35, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((d + e*x)*(a + b*Log[c*x^n])),x]
[Out] Integrate[x^2/((d + e*x)*(a + b*Log[c*x^n])), x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^2}{aex+ad+(bex+bd)\log\left(cx^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="fricas")
[Out] integral(x^2/(a*e*x + a*d + (b*e*x + b*d)*log(c*x^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(ex+d)\left(b\log\left(cx^n\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="giac")
[Out] integrate(x^2/((e*x + d)*(b*log(c*x^n) + a)), x)
```

maple [A] time = 0.51, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(ex+d)(b\ln(cx^n)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(e*x+d)/(b*ln(c*x^n)+a),x)
[Out] int(x^2/(e*x+d)/(b*ln(c*x^n)+a),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(ex+d)\left(b\log(cx^n)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="maxima")
[Out] integrate(x^2/((e*x + d)*(b*log(c*x^n) + a)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^2}{(a+b\,\ln(cx^n))\,(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/((a + b*log(c*x^n))*(d + e*x)),x)
[Out] int(x^2/((a + b*log(c*x^n))*(d + e*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a+b\log(cx^n)\right)(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(e*x+d)/(a+b*ln(c*x**n)),x)
[Out] Integral(x**2/((a + b*log(c*x**n))*(d + e*x)), x)
```

3.158 $\int \frac{x}{(d+ex)(a+b\log(cx^n))} dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{x}{(d+ex)\left(a+b\log\left(cx^n\right)\right)},x\right)$$

```
[Out] Unintegrable(x/(e*x+d)/(a+b*ln(c*x^n)),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{(d+ex)\left(a+b\log\left(cx^n\right)\right)} dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((d + e*x)*(a + b*Log[c*x^n])),x]
[Out] Defer[Int][x/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{x}{(d+ex)\left(a+b\log\left(cx^n\right)\right)} dx = \int \frac{x}{(d+ex)\left(a+b\log\left(cx^n\right)\right)} dx$$

Mathematica [A] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{x}{(d+ex)\left(a+b\log\left(cx^n\right)\right)} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((d + e*x)*(a + b*Log[c*x^n])),x]
[Out] Integrate[x/((d + e*x)*(a + b*Log[c*x^n])), x]
```

fricas [A] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x}{aex+ad+(bex+bd)\log\left(cx^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="fricas")
[Out] integral(x/(a*e*x + a*d + (b*e*x + b*d)*log(c*x^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{(ex+d)\left(b\log\left(cx^n\right)+a\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="giac")
[Out] integrate(x/((e*x + d)*(b*log(c*x^n) + a)), x)
```

maple [A] time = 0.51, size = 0, normalized size = 0.00

$$\int \frac{x}{(ex+d)\left(b\ln\left(c\,x^{n}\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(e*x+d)/(b*ln(c*x^n)+a),x)
[Out] int(x/(e*x+d)/(b*ln(c*x^n)+a),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{(ex+d)\left(b\log\left(cx^{n}\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="maxima")
[Out] integrate(x/((e*x + d)*(b*log(c*x^n) + a)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x}{\left(a+b\,\ln\left(c\,x^{n}\right)\right)\,\left(d+e\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/((a + b*log(c*x^n))*(d + e*x)),x)
[Out] int(x/((a + b*log(c*x^n))*(d + e*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a+b\log\left(cx^{n}\right)\right)(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(e*x+d)/(a+b*ln(c*x**n)),x)
[Out] Integral(x/((a + b*log(c*x**n))*(d + e*x)), x)
```

3.159 $\int \frac{1}{(d+ex)\left(a+b\log(cx^n)\right)}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{1}{(d+ex)\left(a+b\log\left(cx^n\right)\right)},x\right)$$

```
[Out] Unintegrable(1/(e*x+d)/(a+b*ln(c*x^n)),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x)*(a + b*Log[c*x^n])),x]
[Out] Defer[Int][1/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{1}{(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx=\int \frac{1}{(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Mathematica [A] time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x)*(a + b*Log[c*x^n])),x]
[Out] Integrate[1/((d + e*x)*(a + b*Log[c*x^n])), x]
```

fricas [A] time = 0.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{aex+ad+(bex+bd)\log\left(cx^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="fricas")
[Out] integral(1/(a*e*x + a*d + (b*e*x + b*d)*log(c*x^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(ex+d)\left(b\log\left(cx^n\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="giac")
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)), x)
```

maple [A] time = 0.50, size = 0, normalized size = 0.00

$$\int \frac{1}{(ex+d)(b\ln(c\,x^n)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x+d)/(b*ln(c*x^n)+a),x)
[Out] int(1/(e*x+d)/(b*ln(c*x^n)+a),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(ex+d)\left(b\log(cx^n)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="maxima")
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a+b\,\ln(c\,x^n))\,(d+e\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*log(c*x^n))*(d + e*x)),x)
[Out] int(1/((a + b*log(c*x^n))*(d + e*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+b\log(cx^n)\right)(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*ln(c*x**n)),x)
[Out] Integral(1/((a + b*log(c*x**n))*(d + e*x)), x)
```

3.160 $\int \frac{1}{x(d+ex)\left(a+b\log(cx^n)\right)}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{1}{x(d+ex)\left(a+b\log\left(cx^n\right)\right)},x\right)$$

```
[Out] Unintegrable(1/x/(e*x+d)/(a+b*ln(c*x^n)),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(d + e*x)*(a + b*Log[c*x^n])),x]
[Out] Defer[Int][1/(x*(d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{1}{x(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx = \int \frac{1}{x(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Mathematica [A] time = 0.27, size = 0, normalized size = 0.00

$$\int \frac{1}{x(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(d + e*x)*(a + b*Log[c*x^n])),x]
[Out] Integrate[1/(x*(d + e*x)*(a + b*Log[c*x^n])), x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{aex^2+adx+\left(bex^2+bdx\right)\log\left(cx^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="fricas")
[Out] integral(1/(a*e*x^2 + a*d*x + (b*e*x^2 + b*d*x)*log(c*x^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(ex+d)\left(b\log\left(cx^n\right)+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="giac")
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)*x), x)
```

maple [A] time = 0.51, size = 0, normalized size = 0.00

$$\int \frac{1}{(ex+d)\,(b\ln(c\,x^n)+a)\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(e*x+d)/(b*ln(c*x^n)+a),x)
[Out] int(1/x/(e*x+d)/(b*ln(c*x^n)+a),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(ex+d)\left(b\log(cx^n)+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="maxima")
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x\,(a+b\,\ln(c\,x^n))\,(d+e\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*(a + b*log(c*x^n))*(d + e*x)),x)
[Out] int(1/(x*(a + b*log(c*x^n))*(d + e*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a+b\log(cx^n)\right)(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(e*x+d)/(a+b*ln(c*x**n)),x)
[Out] Integral(1/(x*(a + b*log(c*x**n))*(d + e*x)), x)
```

3.161 $\int \frac{1}{x^2(d+ex)(a+b\log(cx^n))}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{1}{x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)},x\right)$$

```
[Out] Unintegrable(1/x^2/(e*x+d)/(a+b*ln(c*x^n)),x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(d + e*x)*(a + b*Log[c*x^n])),x]
[Out] Defer[Int][1/(x^2*(d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{1}{x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx=\int \frac{1}{x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Mathematica [A] time = 0.64, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(d + e*x)*(a + b*Log[c*x^n])),x]
[Out] Integrate[1/(x^2*(d + e*x)*(a + b*Log[c*x^n])), x]
```

fricas [A] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{aex^3+adx^2+\left(bex^3+bdx^2\right)\log\left(cx^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="fricas")
[Out] integral(1/(a*e*x^3 + a*d*x^2 + (b*e*x^3 + b*d*x^2)*log(c*x^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(ex+d)\left(b\log\left(cx^n\right)+a\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)*x^2), x)
```

maple [A] time = 0.54, size = 0, normalized size = 0.00

$$\int \frac{1}{(ex+d)\,(b\ln(c\,x^n)+a)\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(e*x+d)/(b*ln(c*x^n)+a),x)
[Out] int(1/x^2/(e*x+d)/(b*ln(c*x^n)+a),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(ex+d)\left(b\log(cx^n)+a\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="maxima")
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)*x^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x^2\,\left(a+b\,\ln(c\,x^n)\right)\,\left(d+e\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*(a + b*log(c*x^n))*(d + e*x)),x)
[Out] int(1/(x^2*(a + b*log(c*x^n))*(d + e*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(a+b\log(cx^n)\right)(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(e*x+d)/(a+b*ln(c*x**n)),x)
[Out] Integral(1/(x**2*(a + b*log(c*x**n))*(d + e*x)), x)
```

3.162 $\int (fx)^m(d+ex)^3\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=211

$$\frac{d^3(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{3d^2e(fx)^{m+2}\left(a+b\log\left(cx^n\right)\right)}{f^2(m+2)}+\frac{3de^2(fx)^{m+3}\left(a+b\log\left(cx^n\right)\right)}{f^3(m+3)}+\frac{e^3(fx)^{m+4}\left(a+b\,\mathrm{l}\right.}{f^4(m+4}$$

```
[Out] -b*d^3*n*(f*x)^(1+m)/f/(1+m)^2-3*b*d^2*e*n*(f*x)^(2+m)/f^2/(2+m)^2-3*b*d*e^
2*n*(f*x)^(3+m)/f^3/(3+m)^2-b*e^3*n*(f*x)^(4+m)/f^4/(4+m)^2+d^3*(f*x)^(1+m)
*(a+b*ln(c*x^n))/f/(1+m)+3*d^2*e*(f*x)^(2+m)*(a+b*ln(c*x^n))/f^2/(2+m)+3*d*
e^2*(f*x)^(3+m)*(a+b*ln(c*x^n))/f^3/(3+m)+e^3*(f*x)^(4+m)*(a+b*ln(c*x^n))/f
^4/(4+m)
```

Rubi [A] time = 0.23, antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {43, 2350, 14}

$$\frac{3d^2e(fx)^{m+2}\left(a+b\log\left(cx^n\right)\right)}{f^2(m+2)}+\frac{d^3(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{3de^2(fx)^{m+3}\left(a+b\log\left(cx^n\right)\right)}{f^3(m+3)}+\frac{e^3(fx)^{m+4}\left(a+b\,\mathrm{l}\right.}{f^4(m+4}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d^3*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (3*b*d^2*e*n*(f*x)^(2 + m))/(f^2
*(2 + m)^2) - (3*b*d*e^2*n*(f*x)^(3 + m))/(f^3*(3 + m)^2) - (b*e^3*n*(f*x)^
(4 + m))/(f^4*(4 + m)^2) + (d^3*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m
)) + (3*d^2*e*(f*x)^(2 + m)*(a + b*Log[c*x^n]))/(f^2*(2 + m)) + (3*d*e^2*(f
*x)^(3 + m)*(a + b*Log[c*x^n]))/(f^3*(3 + m)) + (e^3*(f*x)^(4 + m)*(a + b*L
og[c*x^n]))/(f^4*(4 + m))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int (fx)^m(d+ex)^3\left(a+b\log\left(cx^n\right)\right)dx = \frac{d^3(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{3d^2e(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)} + \frac{3de^2(fx)}{}$$
$$= \frac{d^3(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{3d^2e(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)} + \frac{3de^2(fx)}{}$$
$$= -\frac{bd^3n(fx)^{1+m}}{f(1+m)^2} - \frac{3bd^2en(fx)^{2+m}}{f^2(2+m)^2} - \frac{3bde^2n(fx)^{3+m}}{f^3(3+m)^2} - \frac{be^3n(fx)^{4+m}}{f^4(4+m)^2} + \frac{d^3(}{}$$

Mathematica [A] time = 0.24, size = 152, normalized size = 0.72

$$x(fx)^m\left(\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{m+1} + \frac{3d^2ex\left(a+b\log\left(cx^n\right)\right)}{m+2} + \frac{3de^2x^2\left(a+b\log\left(cx^n\right)\right)}{m+3} + \frac{e^3x^3\left(a+b\log\left(cx^n\right)\right)}{m+4} - \frac{bd}{(m+}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^3*n)/(1 + m)^2) - (3*b*d^2*e*n*x)/(2 + m)^2 - (3*b*d*e^2*
n*x^2)/(3 + m)^2 - (b*e^3*n*x^3)/(4 + m)^2 + (d^3*(a + b*Log[c*x^n]))/(1 +
m) + (3*d^2*e*x*(a + b*Log[c*x^n]))/(2 + m) + (3*d*e^2*x^2*(a + b*Log[c*x^n
]))/(3 + m) + (e^3*x^3*(a + b*Log[c*x^n]))/(4 + m))
```

fricas [B] time = 0.58, size = 1222, normalized size = 5.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e^3*m^7 + 16*a*e^3*m^6 + 106*a*e^3*m^5 + 376*a*e^3*m^4 + 769*a*e^3*m^3
+ 904*a*e^3*m^2 + 564*a*e^3*m + 144*a*e^3 - (b*e^3*m^6 + 12*b*e^3*m^5 + 58*
b*e^3*m^4 + 144*b*e^3*m^3 + 193*b*e^3*m^2 + 132*b*e^3*m + 36*b*e^3)*n)*x^4
+ 3*(a*d*e^2*m^7 + 17*a*d*e^2*m^6 + 119*a*d*e^2*m^5 + 443*a*d*e^2*m^4 + 944
*a*d*e^2*m^3 + 1148*a*d*e^2*m^2 + 736*a*d*e^2*m + 192*a*d*e^2 - (b*d*e^2*m^
6 + 14*b*d*e^2*m^5 + 77*b*d*e^2*m^4 + 212*b*d*e^2*m^3 + 308*b*d*e^2*m^2 + 2
24*b*d*e^2*m + 64*b*d*e^2)*n)*x^3 + 3*(a*d^2*e*m^7 + 18*a*d^2*e*m^6 + 134*a
*d^2*e*m^5 + 532*a*d^2*e*m^4 + 1209*a*d^2*e*m^3 + 1562*a*d^2*e*m^2 + 1056*a
*d^2*e*m + 288*a*d^2*e - (b*d^2*e*m^6 + 16*b*d^2*e*m^5 + 102*b*d^2*e*m^4 +
328*b*d^2*e*m^3 + 553*b*d^2*e*m^2 + 456*b*d^2*e*m + 144*b*d^2*e)*n)*x^2 + (
a*d^3*m^7 + 19*a*d^3*m^6 + 151*a*d^3*m^5 + 649*a*d^3*m^4 + 1624*a*d^3*m^3 +
 2356*a*d^3*m^2 + 1824*a*d^3*m + 576*a*d^3 - (b*d^3*m^6 + 18*b*d^3*m^5 + 13
3*b*d^3*m^4 + 516*b*d^3*m^3 + 1108*b*d^3*m^2 + 1248*b*d^3*m + 576*b*d^3)*n)
*x + ((b*e^3*m^7 + 16*b*e^3*m^6 + 106*b*e^3*m^5 + 376*b*e^3*m^4 + 769*b*e^3
*m^3 + 904*b*e^3*m^2 + 564*b*e^3*m + 144*b*e^3)*x^4 + 3*(b*d*e^2*m^7 + 17*b
*d*e^2*m^6 + 119*b*d*e^2*m^5 + 443*b*d*e^2*m^4 + 944*b*d*e^2*m^3 + 1148*b*d
*e^2*m^2 + 736*b*d*e^2*m + 192*b*d*e^2)*x^3 + 3*(b*d^2*e*m^7 + 18*b*d^2*e*m
^6 + 134*b*d^2*e*m^5 + 532*b*d^2*e*m^4 + 1209*b*d^2*e*m^3 + 1562*b*d^2*e*m^
2 + 1056*b*d^2*e*m + 288*b*d^2*e)*x^2 + (b*d^3*m^7 + 19*b*d^3*m^6 + 151*b*d
^3*m^5 + 649*b*d^3*m^4 + 1624*b*d^3*m^3 + 2356*b*d^3*m^2 + 1824*b*d^3*m + 5
76*b*d^3)*x)*log(c) + ((b*e^3*m^7 + 16*b*e^3*m^6 + 106*b*e^3*m^5 + 376*b*e^
3*m^4 + 769*b*e^3*m^3 + 904*b*e^3*m^2 + 564*b*e^3*m + 144*b*e^3)*n*x^4 + 3*
(b*d*e^2*m^7 + 17*b*d*e^2*m^6 + 119*b*d*e^2*m^5 + 443*b*d*e^2*m^4 + 944*b*d
*e^2*m^3 + 1148*b*d*e^2*m^2 + 736*b*d*e^2*m + 192*b*d*e^2)*n*x^3 + 3*(b*d^2
*e*m^7 + 18*b*d^2*e*m^6 + 134*b*d^2*e*m^5 + 532*b*d^2*e*m^4 + 1209*b*d^2*e*
m^3 + 1562*b*d^2*e*m^2 + 1056*b*d^2*e*m + 288*b*d^2*e)*n*x^2 + (b*d^3*m^7 +
 19*b*d^3*m^6 + 151*b*d^3*m^5 + 649*b*d^3*m^4 + 1624*b*d^3*m^3 + 2356*b*d^3
```

```
*m^2 + 1824*b*d^3*m + 576*b*d^3)*n*x)*log(x))*e^(m*log(f) + m*log(x))/(m^8
+ 20*m^7 + 170*m^6 + 800*m^5 + 2273*m^4 + 3980*m^3 + 4180*m^2 + 2400*m + 57
6)
```

giac [B] time = 0.50, size = 531, normalized size = 2.52

$$\frac{bf^3f^mx^4x^me^3\log(c)}{f^3m+4f^3}+\frac{af^3f^mx^4x^me^3}{f^3m+4f^3}+\frac{3\,bdf^2f^mx^3x^me^2\log(c)}{f^2m+3f^2}+\frac{bf^mmnx^4x^me^3\log(x)}{m^2+8m+16}+\frac{3\,bdf^mmnx^3x^me^2\log(x}{m^2+6m+9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^3*f^m*x^4*x^m*e^3*log(c)/(f^3*m + 4*f^3) + a*f^3*f^m*x^4*x^m*e^3/(f^3*m
 + 4*f^3) + 3*b*d*f^2*f^m*x^3*x^m*e^2*log(c)/(f^2*m + 3*f^2) + b*f^m*m*n*x^
4*x^m*e^3*log(x)/(m^2 + 8*m + 16) + 3*b*d*f^m*m*n*x^3*x^m*e^2*log(x)/(m^2 +
 6*m + 9) + 3*b*d^2*f^m*m*n*x^2*x^m*e*log(x)/(m^2 + 4*m + 4) + 3*a*d*f^2*f^
m*x^3*x^m*e^2/(f^2*m + 3*f^2) + b*d^3*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1)
+ 4*b*f^m*n*x^4*x^m*e^3*log(x)/(m^2 + 8*m + 16) + 9*b*d*f^m*n*x^3*x^m*e^2*l
og(x)/(m^2 + 6*m + 9) + 6*b*d^2*f^m*n*x^2*x^m*e*log(x)/(m^2 + 4*m + 4) - b*
f^m*n*x^4*x^m*e^3/(m^2 + 8*m + 16) - 3*b*d*f^m*n*x^3*x^m*e^2/(m^2 + 6*m + 9
) - 3*b*d^2*f^m*n*x^2*x^m*e/(m^2 + 4*m + 4) + 3*b*d^2*f^m*x^2*x^m*e*log(c)/
(m + 2) + b*d^3*f^m*n*x*x^m*log(x)/(m^2 + 2*m + 1) - b*d^3*f^m*n*x*x^m/(m^2
 + 2*m + 1) + 3*a*d^2*f^m*x^2*x^m*e/(m + 2) + (f*x)^m*b*d^3*x*log(c)/(m + 1
) + (f*x)^m*a*d^3*x/(m + 1)
```

maple [C] time = 0.69, size = 5021, normalized size = 23.80

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] result too large to display
```

maxima [A] time = 0.88, size = 271, normalized size = 1.28

$$\frac{be^3f^mx^4x^m\log\left(cx^n\right)}{m+4}+\frac{ae^3f^mx^4x^m}{m+4}-\frac{be^3f^mnx^4x^m}{(m+4)^2}+\frac{3\,bde^2f^mx^3x^m\log\left(cx^n\right)}{m+3}+\frac{3\,ade^2f^mx^3x^m}{m+3}-\frac{3\,bde^2f^mnx^3x^m}{(m+3)^2}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] b*e^3*f^m*x^4*x^m*log(c*x^n)/(m + 4) + a*e^3*f^m*x^4*x^m/(m + 4) - b*e^3*f^
m*n*x^4*x^m/(m + 4)^2 + 3*b*d*e^2*f^m*x^3*x^m*log(c*x^n)/(m + 3) + 3*a*d*e^
2*f^m*x^3*x^m/(m + 3) - 3*b*d*e^2*f^m*n*x^3*x^m/(m + 3)^2 + 3*b*d^2*e*f^m*x
^2*x^m*log(c*x^n)/(m + 2) + 3*a*d^2*e*f^m*x^2*x^m/(m + 2) - 3*b*d^2*e*f^m*n
*x^2*x^m/(m + 2)^2 - b*d^3*f^m*n*x*x^m/(m + 1)^2 + (f*x)^(m + 1)*b*d^3*log(
c*x^n)/(f*(m + 1)) + (f*x)^(m + 1)*a*d^3/(f*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(f\,x\right)}^m\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,{\left(d+e\,x\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a + b*log(c*x^n))*(d + e*x)^3,x)
```

```
[Out] int((f*x)^m*(a + b*log(c*x^n))*(d + e*x)^3, x)
```

sympy [A] time = 40.64, size = 8381, normalized size = 39.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise(((-a*d**3/(3*x**3) - 3*a*d**2*e/(2*x**2) - 3*a*d*e**2/x + a*e**3*
log(x) + b*d**3*(-n/(9*x**3) - log(c*x**n)/(3*x**3)) + 3*b*d**2*e*(-n/(4*x*
*2) - log(c*x**n)/(2*x**2)) + 3*b*d*e**2*(-n/x - log(c*x**n)/x) - b*e**3*Pi
ecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True)))/f**4, E
q(m, -4)), ((-a*d**3/(2*x**2) - 3*a*d**2*e/x + 3*a*d*e**2*log(x) + a*e**3*x
 - b*d**3*n*log(x)/(2*x**2) - b*d**3*n/(4*x**2) - b*d**3*log(c)/(2*x**2) -
3*b*d**2*e*n*log(x)/x - 3*b*d**2*e*n/x - 3*b*d**2*e*log(c)/x + 3*b*d*e**2*n
*log(x)**2/2 + 3*b*d*e**2*log(c)*log(x) + b*e**3*n*x*log(x) - b*e**3*n*x +
b*e**3*x*log(c))/f**3, Eq(m, -3)), ((-a*d**3/x + 3*a*d**2*e*log(x) + 3*a*d*
e**2*x + a*e**3*x**2/2 - b*d**3*n*log(x)/x - b*d**3*n/x - b*d**3*log(c)/x +
 3*b*d**2*e*n*log(x)**2/2 + 3*b*d**2*e*log(c)*log(x) + 3*b*d*e**2*n*x*log(x
) - 3*b*d*e**2*n*x + 3*b*d*e**2*x*log(c) + b*e**3*n*x**2*log(x)/2 - b*e**3*
n*x**2/4 + b*e**3*x**2*log(c)/2)/f**2, Eq(m, -2)), ((a*d**3*log(x) + 3*a*d*
*2*e*x + 3*a*d*e**2*x**2/2 + a*e**3*x**3/3 + b*d**3*n*log(x)**2/2 + b*d**3*
log(c)*log(x) + 3*b*d**2*e*n*x*log(x) - 3*b*d**2*e*n*x + 3*b*d**2*e*x*log(c
) + 3*b*d*e**2*n*x**2*log(x)/2 - 3*b*d*e**2*n*x**2/4 + 3*b*d*e**2*x**2*log(
c)/2 + b*e**3*n*x**3*log(x)/3 - b*e**3*n*x**3/9 + b*e**3*x**3*log(c)/3)/f,
Eq(m, -1)), (a*d**3*f**m*m**7*x*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5
+ 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 19*a*d**3*f**m*m**6*x
*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*
m**2 + 2400*m + 576) + 151*a*d**3*f**m*m**5*x*x**m/(m**8 + 20*m**7 + 170*m*
*6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 649*a*d
**3*f**m*m**4*x*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 39
80*m**3 + 4180*m**2 + 2400*m + 576) + 1624*a*d**3*f**m*m**3*x*x**m/(m**8 +
20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m
+ 576) + 2356*a*d**3*f**m*m**2*x*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5
 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 1824*a*d**3*f**m*m*x
*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*
m**2 + 2400*m + 576) + 576*a*d**3*f**m*x*x**m/(m**8 + 20*m**7 + 170*m**6 +
800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 3*a*d**2*e*f
**m*m**7*x**2*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980
*m**3 + 4180*m**2 + 2400*m + 576) + 54*a*d**2*e*f**m*m**6*x**2*x**m/(m**8 +
 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m
 + 576) + 402*a*d**2*e*f**m*m**5*x**2*x**m/(m**8 + 20*m**7 + 170*m**6 + 800
*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 1596*a*d**2*e*f
**m*m**4*x**2*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980
*m**3 + 4180*m**2 + 2400*m + 576) + 3627*a*d**2*e*f**m*m**3*x**2*x**m/(m**8
 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400
*m + 576) + 4686*a*d**2*e*f**m*m**2*x**2*x**m/(m**8 + 20*m**7 + 170*m**6 +
800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 3168*a*d**2*
e*f**m*m*x**2*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980
*m**3 + 4180*m**2 + 2400*m + 576) + 864*a*d**2*e*f**m*x**2*x**m/(m**8 + 20*
m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 5
76) + 3*a*d*e**2*f**m*m**7*x**3*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5
+ 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 51*a*d*e**2*f**m*m**6
*x**3*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 +
4180*m**2 + 2400*m + 576) + 357*a*d*e**2*f**m*m**5*x**3*x**m/(m**8 + 20*m**
7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576)
 + 1329*a*d*e**2*f**m*m**4*x**3*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5
+ 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 2832*a*d*e**2*f**m*m*
*3*x**3*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3
+ 4180*m**2 + 2400*m + 576) + 3444*a*d*e**2*f**m*m**2*x**3*x**m/(m**8 + 20*
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m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 5
76) + 2208*a*d*e**2*f**m*m*x**3*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5
+ 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 576*a*d*e**2*f**m*x**
3*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180
*m**2 + 2400*m + 576) + a*e**3*f**m*m**7*x**4*x**m/(m**8 + 20*m**7 + 170*m*
*6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 16*a*e*
*3*f**m*m**6*x**4*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 +
3980*m**3 + 4180*m**2 + 2400*m + 576) + 106*a*e**3*f**m*m**5*x**4*x**m/(m**
8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 240
0*m + 576) + 376*a*e**3*f**m*m**4*x**4*x**m/(m**8 + 20*m**7 + 170*m**6 + 80
0*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 769*a*e**3*f**
m*m**3*x**4*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m
3 + 4180*m2 + 2400*m + 576) + 904*a*e**3*f**m*m**2*x**4*x**m/(m**8 + 20
*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m +
576) + 564*a*e**3*f**m*m*x**4*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 +
2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 144*a*e**3*f**m*x**4*x*
*m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**
2 + 2400*m + 576) + b*d**3*f**m*m**7*n*x*x**m*log(x)/(m**8 + 20*m**7 + 170*
m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + b*d**
3*f**m*m**7*x*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4
 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 19*b*d**3*f**m*m**6*n*x*x**m*log
(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m*
*2 + 2400*m + 576) - b*d**3*f**m*m**6*n*x*x**m/(m**8 + 20*m**7 + 170*m**6 +
 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 19*b*d**3*f
m*m6*x*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 +
3980*m**3 + 4180*m**2 + 2400*m + 576) + 151*b*d**3*f**m*m**5*n*x*x**m*log(x
)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2
 + 2400*m + 576) - 18*b*d**3*f**m*m**5*n*x*x**m/(m**8 + 20*m**7 + 170*m**6
+ 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 151*b*d**3
*f**m*m**5*x*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4
+ 3980*m**3 + 4180*m**2 + 2400*m + 576) + 649*b*d**3*f**m*m**4*n*x*x**m*log
(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m*
*2 + 2400*m + 576) - 133*b*d**3*f**m*m**4*n*x*x**m/(m**8 + 20*m**7 + 170*m*
*6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 649*b*d
3*fm*m**4*x*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m*
*4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 1624*b*d**3*f**m*m**3*n*x*x**m
*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 418
0*m**2 + 2400*m + 576) - 516*b*d**3*f**m*m**3*n*x*x**m/(m**8 + 20*m**7 + 17
0*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 162
4*b*d**3*f**m*m**3*x*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 22
73*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 2356*b*d**3*f**m*m**2*n*x
*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3
+ 4180*m**2 + 2400*m + 576) - 1108*b*d**3*f**m*m**2*n*x*x**m/(m**8 + 20*m**
7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576)
 + 2356*b*d**3*f**m*m**2*x*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**
5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 1824*b*d**3*f**m*m*
n*x*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m*
*3 + 4180*m**2 + 2400*m + 576) - 1248*b*d**3*f**m*m*n*x*x**m/(m**8 + 20*m**
7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576)
 + 1824*b*d**3*f**m*m*x*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 +
 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 576*b*d**3*f**m*n*x*x*
*m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4
180*m**2 + 2400*m + 576) - 576*b*d**3*f**m*n*x*x**m/(m**8 + 20*m**7 + 170*m
6 + 800*m5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 576*b*
d**3*f**m*x*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 +
 3980*m**3 + 4180*m**2 + 2400*m + 576) + 3*b*d**2*e*f**m*m**7*n*x**2*x**m*l
og(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*
m**2 + 2400*m + 576) + 3*b*d**2*e*f**m*m**7*x**2*x**m*log(c)/(m**8 + 20*m**
7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576)

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 + 54*b*d**2*e*f**m*m**6*n*x**2*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 80
0*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) - 3*b*d**2*e*f**
m*m**6*n*x**2*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980
*m**3 + 4180*m**2 + 2400*m + 576) + 54*b*d**2*e*f**m*m**6*x**2*x**m*log(c)/
(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 +
 2400*m + 576) + 402*b*d**2*e*f**m*m**5*n*x**2*x**m*log(x)/(m**8 + 20*m**7
+ 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) -
 48*b*d**2*e*f**m*m**5*n*x**2*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 +
2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 402*b*d**2*e*f**m*m**5*
x**2*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m
**3 + 4180*m**2 + 2400*m + 576) + 1596*b*d**2*e*f**m*m**4*n*x**2*x**m*log(x
)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2
 + 2400*m + 576) - 306*b*d**2*e*f**m*m**4*n*x**2*x**m/(m**8 + 20*m**7 + 170
*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 1596
*b*d**2*e*f**m*m**4*x**2*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5
+ 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 3627*b*d**2*e*f**m*m*
*3*n*x**2*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3
980*m**3 + 4180*m**2 + 2400*m + 576) - 984*b*d**2*e*f**m*m**3*n*x**2*x**m/(
m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 +
2400*m + 576) + 3627*b*d**2*e*f**m*m**3*x**2*x**m*log(c)/(m**8 + 20*m**7 +
170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 4
686*b*d**2*e*f**m*m**2*n*x**2*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*
m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) - 1659*b*d**2*e*f*
*m*m**2*n*x**2*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 398
0*m**3 + 4180*m**2 + 2400*m + 576) + 4686*b*d**2*e*f**m*m**2*x**2*x**m*log(
c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**
2 + 2400*m + 576) + 3168*b*d**2*e*f**m*m*n*x**2*x**m*log(x)/(m**8 + 20*m**7
 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576)
- 1368*b*d**2*e*f**m*m*n*x**2*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 +
2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 3168*b*d**2*e*f**m*m*x*
*2*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**
3 + 4180*m**2 + 2400*m + 576) + 864*b*d**2*e*f**m*n*x**2*x**m*log(x)/(m**8
+ 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*
m + 576) - 432*b*d**2*e*f**m*n*x**2*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m
**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 864*b*d**2*e*f**m
*x**2*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*
m**3 + 4180*m**2 + 2400*m + 576) + 3*b*d*e**2*f**m*m**7*n*x**3*x**m*log(x)/
(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 +
 2400*m + 576) + 3*b*d*e**2*f**m*m**7*x**3*x**m*log(c)/(m**8 + 20*m**7 + 17
0*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 51*
b*d*e**2*f**m*m**6*n*x**3*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5
 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) - 3*b*d*e**2*f**m*m**6
*n*x**3*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3
+ 4180*m**2 + 2400*m + 576) + 51*b*d*e**2*f**m*m**6*x**3*x**m*log(c)/(m**8
+ 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*
m + 576) + 357*b*d*e**2*f**m*m**5*n*x**3*x**m*log(x)/(m**8 + 20*m**7 + 170*
m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) - 42*b*
d*e**2*f**m*m**5*n*x**3*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m
**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 357*b*d*e**2*f**m*m**5*x**3*x
**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 +
4180*m**2 + 2400*m + 576) + 1329*b*d*e**2*f**m*m**4*n*x**3*x**m*log(x)/(m**
8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 240
0*m + 576) - 231*b*d*e**2*f**m*m**4*n*x**3*x**m/(m**8 + 20*m**7 + 170*m**6
+ 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 1329*b*d*e
**2*f**m*m**4*x**3*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273
*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 2832*b*d*e**2*f**m*m**3*n*x
**3*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m*
*3 + 4180*m**2 + 2400*m + 576) - 636*b*d*e**2*f**m*m**3*n*x**3*x**m/(m**8 +
 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m
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 + 576) + 2832*b*d*e**2*f**m*m**3*x**3*x**m*log(c)/(m**8 + 20*m**7 + 170*m*
*6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 3444*b*
d*e**2*f**m*m**2*n*x**3*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 +
 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) - 924*b*d*e**2*f**m*m**2
*n*x**3*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3
+ 4180*m**2 + 2400*m + 576) + 3444*b*d*e**2*f**m*m**2*x**3*x**m*log(c)/(m**
8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 240
0*m + 576) + 2208*b*d*e**2*f**m*m*n*x**3*x**m*log(x)/(m**8 + 20*m**7 + 170*
m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) - 672*b
*d*e**2*f**m*m*n*x**3*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**
4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 2208*b*d*e**2*f**m*m*x**3*x**m*
log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180
*m**2 + 2400*m + 576) + 576*b*d*e**2*f**m*n*x**3*x**m*log(x)/(m**8 + 20*m**
7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576)
 - 192*b*d*e**2*f**m*n*x**3*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 22
73*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 576*b*d*e**2*f**m*x**3*x*
*m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4
180*m**2 + 2400*m + 576) + b*e**3*f**m*m**7*n*x**4*x**m*log(x)/(m**8 + 20*m
**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 57
6) + b*e**3*f**m*m**7*x**4*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**
5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 16*b*e**3*f**m*m**6
*n*x**4*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 398
0*m**3 + 4180*m**2 + 2400*m + 576) - b*e**3*f**m*m**6*n*x**4*x**m/(m**8 + 2
0*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m +
 576) + 16*b*e**3*f**m*m**6*x**4*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 8
00*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 106*b*e**3*f*
*m*m**5*n*x**4*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**
4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) - 12*b*e**3*f**m*m**5*n*x**4*x**m
/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2
+ 2400*m + 576) + 106*b*e**3*f**m*m**5*x**4*x**m*log(c)/(m**8 + 20*m**7 + 1
70*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 37
6*b*e**3*f**m*m**4*n*x**4*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5
 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) - 58*b*e**3*f**m*m**4*
n*x**4*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 +
 4180*m**2 + 2400*m + 576) + 376*b*e**3*f**m*m**4*x**4*x**m*log(c)/(m**8 +
20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m
+ 576) + 769*b*e**3*f**m*m**3*n*x**4*x**m*log(x)/(m**8 + 20*m**7 + 170*m**6
 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) - 144*b*e**
3*f**m*m**3*n*x**4*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 +
 3980*m**3 + 4180*m**2 + 2400*m + 576) + 769*b*e**3*f**m*m**3*x**4*x**m*log
(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m*
*2 + 2400*m + 576) + 904*b*e**3*f**m*m**2*n*x**4*x**m*log(x)/(m**8 + 20*m**
7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576)
 - 193*b*e**3*f**m*m**2*n*x**4*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 +
 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 904*b*e**3*f**m*m**2*x
**4*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m*
*3 + 4180*m**2 + 2400*m + 576) + 564*b*e**3*f**m*m*n*x**4*x**m*log(x)/(m**8
 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400
*m + 576) - 132*b*e**3*f**m*m*n*x**4*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*
m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 564*b*e**3*f**m*
m*x**4*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980
*m**3 + 4180*m**2 + 2400*m + 576) + 144*b*e**3*f**m*n*x**4*x**m*log(x)/(m**
8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 240
0*m + 576) - 36*b*e**3*f**m*n*x**4*x**m/(m**8 + 20*m**7 + 170*m**6 + 800*m*
*5 + 2273*m**4 + 3980*m**3 + 4180*m**2 + 2400*m + 576) + 144*b*e**3*f**m*x*
*4*x**m*log(c)/(m**8 + 20*m**7 + 170*m**6 + 800*m**5 + 2273*m**4 + 3980*m**
3 + 4180*m**2 + 2400*m + 576), True))
```

3.163 $\int (fx)^m(d+ex)^2 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=153

$$\frac{d^2(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{2de(fx)^{m+2}\left(a+b\log\left(cx^n\right)\right)}{f^2(m+2)}+\frac{e^2(fx)^{m+3}\left(a+b\log\left(cx^n\right)\right)}{f^3(m+3)}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-\frac{2bden(fx}{f^2(m+}$$

```
[Out] -b*d^2*n*(f*x)^(1+m)/f/(1+m)^2-2*b*d*e*n*(f*x)^(2+m)/f^2/(2+m)^2-b*e^2*n*(f
*x)^(3+m)/f^3/(3+m)^2+d^2*(f*x)^(1+m)*(a+b*ln(c*x^n))/f/(1+m)+2*d*e*(f*x)^(
2+m)*(a+b*ln(c*x^n))/f^2/(2+m)+e^2*(f*x)^(3+m)*(a+b*ln(c*x^n))/f^3/(3+m)
```

Rubi [A] time = 0.17, antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {43, 2350, 12, 14}

$$\frac{d^2(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{2de(fx)^{m+2}\left(a+b\log\left(cx^n\right)\right)}{f^2(m+2)}+\frac{e^2(fx)^{m+3}\left(a+b\log\left(cx^n\right)\right)}{f^3(m+3)}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-\frac{2bden(fx}{f^2(m+}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d^2*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (2*b*d*e*n*(f*x)^(2 + m))/(f^2*(
2 + m)^2) - (b*e^2*n*(f*x)^(3 + m))/(f^3*(3 + m)^2) + (d^2*(f*x)^(1 + m)*(a
 + b*Log[c*x^n]))/(f*(1 + m)) + (2*d*e*(f*x)^(2 + m)*(a + b*Log[c*x^n]))/(f
^2*(2 + m)) + (e^2*(f*x)^(3 + m)*(a + b*Log[c*x^n]))/(f^3*(3 + m))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int (fx)^m(d+ex)^2\left(a+b\log\left(cx^n\right)\right)\,dx = \frac{d^2(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{2de(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)} + \frac{e^2(fx)^3}{}$$

$$= \frac{d^2(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{2de(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)} + \frac{e^2(fx)^3}{}$$

$$= \frac{d^2(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{2de(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)} + \frac{e^2(fx)^3}{}$$

$$= -\frac{bd^2n(fx)^{1+m}}{f(1+m)^2} - \frac{2bden(fx)^{2+m}}{f^2(2+m)^2} - \frac{be^2n(fx)^{3+m}}{f^3(3+m)^2} + \frac{d^2(fx)^{1+m}\left(a+b\,\mathrm{lo}\right.}{f(1+m)}$$

Mathematica [A] time = 0.14, size = 108, normalized size = 0.71

$$x(fx)^m\left(\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{m+1} + \frac{2dex\left(a+b\log\left(cx^n\right)\right)}{m+2} + \frac{e^2x^2\left(a+b\log\left(cx^n\right)\right)}{m+3} - \frac{bd^2n}{(m+1)^2} - \frac{2bdenx}{(m+2)^2} - \frac{be^2nx}{(m+3}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^2*n)/(1 + m)^2) - (2*b*d*e*n*x)/(2 + m)^2 - (b*e^2*n*x^2)
/(3 + m)^2 + (d^2*(a + b*Log[c*x^n]))/(1 + m) + (2*d*e*x*(a + b*Log[c*x^n])
)/(2 + m) + (e^2*x^2*(a + b*Log[c*x^n]))/(3 + m))
```

fricas [B] time = 0.46, size = 633, normalized size = 4.14

$$\frac{\left(\left(ae^2m^5 + 9\,ae^2m^4 + 31\,ae^2m^3 + 51\,ae^2m^2 + 40\,ae^2m + 12\,ae^2 - \left(be^2m^4 + 6\,be^2m^3 + 13\,be^2m^2 + 12\,be^2m + 4\,b\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e^2*m^5 + 9*a*e^2*m^4 + 31*a*e^2*m^3 + 51*a*e^2*m^2 + 40*a*e^2*m + 12*a
*e^2 - (b*e^2*m^4 + 6*b*e^2*m^3 + 13*b*e^2*m^2 + 12*b*e^2*m + 4*b*e^2)*n)*x
^3 + 2*(a*d*e*m^5 + 10*a*d*e*m^4 + 38*a*d*e*m^3 + 68*a*d*e*m^2 + 57*a*d*e*m
 + 18*a*d*e - (b*d*e*m^4 + 8*b*d*e*m^3 + 22*b*d*e*m^2 + 24*b*d*e*m + 9*b*d*
e)*n)*x^2 + (a*d^2*m^5 + 11*a*d^2*m^4 + 47*a*d^2*m^3 + 97*a*d^2*m^2 + 96*a*
d^2*m + 36*a*d^2 - (b*d^2*m^4 + 10*b*d^2*m^3 + 37*b*d^2*m^2 + 60*b*d^2*m +
36*b*d^2)*n)*x + ((b*e^2*m^5 + 9*b*e^2*m^4 + 31*b*e^2*m^3 + 51*b*e^2*m^2 +
40*b*e^2*m + 12*b*e^2)*x^3 + 2*(b*d*e*m^5 + 10*b*d*e*m^4 + 38*b*d*e*m^3 + 6
8*b*d*e*m^2 + 57*b*d*e*m + 18*b*d*e)*x^2 + (b*d^2*m^5 + 11*b*d^2*m^4 + 47*b
*d^2*m^3 + 97*b*d^2*m^2 + 96*b*d^2*m + 36*b*d^2)*x)*log(c) + ((b*e^2*m^5 +
9*b*e^2*m^4 + 31*b*e^2*m^3 + 51*b*e^2*m^2 + 40*b*e^2*m + 12*b*e^2)*n*x^3 +
2*(b*d*e*m^5 + 10*b*d*e*m^4 + 38*b*d*e*m^3 + 68*b*d*e*m^2 + 57*b*d*e*m + 18
*b*d*e)*n*x^2 + (b*d^2*m^5 + 11*b*d^2*m^4 + 47*b*d^2*m^3 + 97*b*d^2*m^2 + 9
6*b*d^2*m + 36*b*d^2)*n*x)*log(x))*e^(m*log(f) + m*log(x))/(m^6 + 12*m^5 +
58*m^4 + 144*m^3 + 193*m^2 + 132*m + 36)
```

giac [B] time = 0.55, size = 374, normalized size = 2.44

$$\frac{bf^2f^mx^3x^me^2\log(c)}{f^2m+3\,f^2} + \frac{bf^mmnx^3x^me^2\log(x)}{m^2+6\,m+9} + \frac{2\,bdf^mmnx^2x^me\log(x)}{m^2+4\,m+4} + \frac{af^2f^mx^3x^me^2}{f^2m+3\,f^2} + \frac{bd^2f^mmnxx^m\log(x)}{m^2+2\,m+1} + \cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^2*f^m*x^3*x^m*e^2*log(c)/(f^2*m + 3*f^2) + b*f^m*m*n*x^3*x^m*e^2*log(x)
/(m^2 + 6*m + 9) + 2*b*d*f^m*m*n*x^2*x^m*e*log(x)/(m^2 + 4*m + 4) + a*f^2*f
^m*x^3*x^m*e^2/(f^2*m + 3*f^2) + b*d^2*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1)
 + 3*b*f^m*n*x^3*x^m*e^2*log(x)/(m^2 + 6*m + 9) + 4*b*d*f^m*n*x^2*x^m*e*log
(x)/(m^2 + 4*m + 4) - b*f^m*n*x^3*x^m*e^2/(m^2 + 6*m + 9) - 2*b*d*f^m*n*x^2
*x^m*e/(m^2 + 4*m + 4) + 2*b*d*f^m*x^2*x^m*e*log(c)/(m + 2) + b*d^2*f^m*n*x
*x^m*log(x)/(m^2 + 2*m + 1) - b*d^2*f^m*n*x*x^m/(m^2 + 2*m + 1) + 2*a*d*f^m
*x^2*x^m*e/(m + 2) + (f*x)^m*b*d^2*x*log(c)/(m + 1) + (f*x)^m*a*d^2*x/(m +
1)
```

maple [C] time = 0.38, size = 2702, normalized size = 17.66

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] b*x*(e^2*m^2*x^2+2*d*e*m^2*x+3*e^2*m*x^2+d^2*m^2+8*d*e*m*x+2*e^2*x^2+5*d^2*
m+6*d*e*x+6*d^2)/(m+1)/(m+2)/(m+3)*exp(1/2*m*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn
(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)
*csgn(I*x)+2*ln(f)+2*ln(x)))*ln(x^n)+1/2*x*(I*Pi*b*e^2*m^5*x^2*csgn(I*c*x^n
)^2*csgn(I*c)+I*Pi*b*e^2*m^5*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+51*I*Pi*b*e^2*
m^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+51*I*Pi*b*e^2*m^2*x^2*csgn(I*c*x^n)^2*c
sgn(I*c)-2*I*Pi*b*d*e*m^5*x*csgn(I*c*x^n)^3-74*b*d^2*m^2*n-120*b*d^2*m*n+72
*b*d*e*x*ln(c)+12*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+12*I*Pi*b*e^2*
x^2*csgn(I*c*x^n)^2*csgn(I*c)+96*I*Pi*b*d^2*m*csgn(I*x^n)*csgn(I*c*x^n)^2+9
6*I*Pi*b*d^2*m*csgn(I*c*x^n)^2*csgn(I*c)+2*a*e^2*m^5*x^2-2*b*d^2*m^4*n+72*a
*d^2-20*b*d^2*m^3*n+94*a*d^2*m^3+194*a*d^2*m^2+192*a*d^2*m+18*a*e^2*m^4*x^2
+24*a*e^2*x^2-72*b*d^2*n+22*a*d^2*m^4+2*a*d^2*m^5+2*ln(c)*b*d^2*m^5+22*ln(c
)*b*d^2*m^4+94*ln(c)*b*d^2*m^3+194*ln(c)*b*d^2*m^2+192*ln(c)*b*d^2*m+24*b*e
^2*x^2*ln(c)+72*a*d*e*x+72*b*d^2*ln(c)+40*I*Pi*b*e^2*m*x^2*csgn(I*x^n)*csgn
(I*c*x^n)^2+40*I*Pi*b*e^2*m*x^2*csgn(I*c*x^n)^2*csgn(I*c)-97*I*Pi*b*d^2*m^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-36*I*Pi*b*d*e*x*csgn(I*c*x^n)^3-31*I*P
i*b*e^2*m^3*x^2*csgn(I*c*x^n)^3-51*I*Pi*b*e^2*m^2*x^2*csgn(I*c*x^n)^3-I*Pi*
b*e^2*m^5*x^2*csgn(I*c*x^n)^3-4*b*d*e*m^4*n*x-12*b*e^2*m^3*n*x^2+40*a*d*e*m
^4*x+4*a*d*e*m^5*x-76*I*Pi*b*d*e*m^3*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-
136*I*Pi*b*d*e*m^2*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-114*I*Pi*b*d*e*m*x
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*b*e^2*n*x^2-26*b*e^2*m^2*n*x^2-88*b*
d*e*m^2*n*x-24*b*e^2*m*n*x^2-96*b*d*e*m*n*x+I*Pi*b*d^2*m^5*csgn(I*x^n)*csgn
(I*c*x^n)^2+I*Pi*b*d^2*m^5*csgn(I*c*x^n)^2*csgn(I*c)-36*I*Pi*b*d^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)+47*I*Pi*b*d^2*m^3*csgn(I*x^n)*csgn(I*c*x^n)^2+6
2*ln(c)*b*e^2*m^3*x^2+102*ln(c)*b*e^2*m^2*x^2+80*ln(c)*b*e^2*m*x^2+18*ln(c)
*b*e^2*m^4*x^2+2*ln(c)*b*e^2*m^5*x^2+62*a*e^2*m^3*x^2+102*a*e^2*m^2*x^2+80*
a*e^2*m*x^2+152*a*d*e*m^3*x+272*a*d*e*m^2*x+228*a*d*e*m*x-2*b*e^2*m^4*n*x^2
-2*I*Pi*b*d*e*m^5*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-20*I*Pi*b*d*e*m^4*x
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+47*I*Pi*b*d^2*m^3*csgn(I*c*x^n)^2*csgn
(I*c)-40*I*Pi*b*e^2*m*x^2*csgn(I*c*x^n)^3+97*I*Pi*b*d^2*m^2*csgn(I*x^n)*csg
n(I*c*x^n)^2+97*I*Pi*b*d^2*m^2*csgn(I*c*x^n)^2*csgn(I*c)-32*b*d*e*m^3*n*x+3
6*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-47*I*Pi*b*d^2*m^3*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)-136*I*Pi*b*d*e*m^2*x*csgn(I*c*x^n)^3-47*I*Pi*b*d^2*m^3*
csgn(I*c*x^n)^3-97*I*Pi*b*d^2*m^2*csgn(I*c*x^n)^3-36*I*Pi*b*d^2*csgn(I*c*x^
n)^3-36*b*d*e*n*x+20*I*Pi*b*d*e*m^4*x*csgn(I*c*x^n)^2*csgn(I*c)-9*I*Pi*b*e^
2*m^4*x^2*csgn(I*c*x^n)^3+11*I*Pi*b*d^2*m^4*csgn(I*x^n)*csgn(I*c*x^n)^2+11*
I*Pi*b*d^2*m^4*csgn(I*c*x^n)^2*csgn(I*c)-9*I*Pi*b*e^2*m^4*x^2*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+20*I*Pi*b*d*e*m^4*x*csgn(I*x^n)*csgn(I*c*x^n)^2+152*
ln(c)*b*d*e*m^3*x+272*ln(c)*b*d*e*m^2*x+228*ln(c)*b*d*e*m*x+4*ln(c)*b*d*e*m
^5*x+40*ln(c)*b*d*e*m^4*x+36*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+36*I*Pi
*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d^2*m^5*csgn(I*c*x^n)^3-31*I*Pi*b*e
```

```
^2*m^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+76*I*Pi*b*d*e*m^3*x*csgn(I*x
^n)*csgn(I*c*x^n)^2+76*I*Pi*b*d*e*m^3*x*csgn(I*c*x^n)^2*csgn(I*c)-51*I*Pi*b
*e^2*m^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+136*I*Pi*b*d*e*m^2*x*csgn(
I*x^n)*csgn(I*c*x^n)^2+136*I*Pi*b*d*e*m^2*x*csgn(I*c*x^n)^2*csgn(I*c)+9*I*P
i*b*e^2*m^4*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+9*I*Pi*b*e^2*m^4*x^2*csgn(I*c*x
^n)^2*csgn(I*c)-I*Pi*b*d^2*m^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-20*I*Pi*
b*d*e*m^4*x*csgn(I*c*x^n)^3-11*I*Pi*b*d^2*m^4*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)-12*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-96*I*Pi*b*d^2*
m*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+36*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*
x^n)^2-36*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*e^2*m^5*x
^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi*b*d*e*m^5*x*csgn(I*x^n)*csgn(
I*c*x^n)^2+2*I*Pi*b*d*e*m^5*x*csgn(I*c*x^n)^2*csgn(I*c)-40*I*Pi*b*e^2*m*x^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+114*I*Pi*b*d*e*m*x*csgn(I*x^n)*csgn(I*
c*x^n)^2+114*I*Pi*b*d*e*m*x*csgn(I*c*x^n)^2*csgn(I*c)-114*I*Pi*b*d*e*m*x*cs
gn(I*c*x^n)^3+31*I*Pi*b*e^2*m^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+31*I*Pi*b*e
^2*m^3*x^2*csgn(I*c*x^n)^2*csgn(I*c)-76*I*Pi*b*d*e*m^3*x*csgn(I*c*x^n)^3-11
*I*Pi*b*d^2*m^4*csgn(I*c*x^n)^3-12*I*Pi*b*e^2*x^2*csgn(I*c*x^n)^3-96*I*Pi*b
*d^2*m*csgn(I*c*x^n)^3)/(m+3)^2/(m+1)^2/(m+2)^2*exp(1/2*m*(-I*Pi*csgn(I*f*x
)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f
*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+2*ln(x)))
```

maxima [A] time = 0.87, size = 195, normalized size = 1.27

$$\frac{be^2f^mx^3x^m\log(cx^n)}{m+3}+\frac{ae^2f^mx^3x^m}{m+3}-\frac{be^2f^mnx^3x^m}{(m+3)^2}+\frac{2\,bdef^mx^2x^m\log(cx^n)}{m+2}+\frac{2\,adef^mx^2x^m}{m+2}-\frac{2\,bdef^mnx^2x^m}{(m+2)^2}-\frac{bd^2}{(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] b*e^2*f^m*x^3*x^m*log(c*x^n)/(m + 3) + a*e^2*f^m*x^3*x^m/(m + 3) - b*e^2*f^
m*n*x^3*x^m/(m + 3)^2 + 2*b*d*e*f^m*x^2*x^m*log(c*x^n)/(m + 2) + 2*a*d*e*f^
m*x^2*x^m/(m + 2) - 2*b*d*e*f^m*n*x^2*x^m/(m + 2)^2 - b*d^2*f^m*n*x*x^m/(m
+ 1)^2 + (f*x)^(m + 1)*b*d^2*log(c*x^n)/(f*(m + 1)) + (f*x)^(m + 1)*a*d^2/(
f*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (f\,x)^m\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,\left(d+e\,x\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a + b*log(c*x^n))*(d + e*x)^2,x)
```

```
[Out] int((f*x)^m*(a + b*log(c*x^n))*(d + e*x)^2, x)
```

sympy [A] time = 20.29, size = 3815, normalized size = 24.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise(((-a*d**2/(2*x**2) - 2*a*d*e/x + a*e**2*log(x) + b*d**2*(-n/(4*x*
*2) - log(c*x**n)/(2*x**2)) + 2*b*d*e*(-n/x - log(c*x**n)/x) - b*e**2*Piece
wise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True)))/f**3, Eq(m
, -3)), ((-a*d**2/x + 2*a*d*e*log(x) + a*e**2*x - b*d**2*n*log(x)/x - b*d**
2*n/x - b*d**2*log(c)/x + b*d*e*n*log(x)**2 + 2*b*d*e*log(c)*log(x) + b*e**
2*n*x*log(x) - b*e**2*n*x + b*e**2*x*log(c))/f**2, Eq(m, -2)), ((a*d**2*log
(x) + 2*a*d*e*x + a*e**2*x**2/2 + b*d**2*n*log(x)**2/2 + b*d**2*log(c)*log(
```

```
x) + 2*b*d*e*n*x*log(x) - 2*b*d*e*n*x + 2*b*d*e*x*log(c) + b*e**2*n*x**2*lo
g(x)/2 - b*e**2*n*x**2/4 + b*e**2*x**2*log(c)/2)/f, Eq(m, -1)), (a*d**2*f**
m*m**5*x*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36)
 + 11*a*d**2*f**m*m**4*x*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m*
*2 + 132*m + 36) + 47*a*d**2*f**m*m**3*x*x**m/(m**6 + 12*m**5 + 58*m**4 + 1
44*m**3 + 193*m**2 + 132*m + 36) + 97*a*d**2*f**m*m**2*x*x**m/(m**6 + 12*m*
*5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 96*a*d**2*f**m*m*x*x**m/
(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 36*a*d**2*f
**m*x*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) +
2*a*d*e*f**m*m**5*x**2*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2
 + 132*m + 36) + 20*a*d*e*f**m*m**4*x**2*x**m/(m**6 + 12*m**5 + 58*m**4 + 1
44*m**3 + 193*m**2 + 132*m + 36) + 76*a*d*e*f**m*m**3*x**2*x**m/(m**6 + 12*
m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 136*a*d*e*f**m*m**2*x*
*2*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 114
*a*d*e*f**m*m*x**2*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 1
32*m + 36) + 36*a*d*e*f**m*x**2*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 +
 193*m**2 + 132*m + 36) + a*e**2*f**m*m**5*x**3*x**m/(m**6 + 12*m**5 + 58*m
**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 9*a*e**2*f**m*m**4*x**3*x**m/(m**
6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 31*a*e**2*f**m*
m**3*x**3*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36
) + 51*a*e**2*f**m*m**2*x**3*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 19
3*m**2 + 132*m + 36) + 40*a*e**2*f**m*m*x**3*x**m/(m**6 + 12*m**5 + 58*m**4
 + 144*m**3 + 193*m**2 + 132*m + 36) + 12*a*e**2*f**m*x**3*x**m/(m**6 + 12*
m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + b*d**2*f**m*m**5*n*x*x
**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) +
b*d**2*f**m*m**5*x*x**m*log(c)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m
**2 + 132*m + 36) + 11*b*d**2*f**m*m**4*n*x*x**m*log(x)/(m**6 + 12*m**5 + 5
8*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) - b*d**2*f**m*m**4*n*x*x**m/(m**
6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 11*b*d**2*f**m*
m**4*x*x**m*log(c)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m
+ 36) + 47*b*d**2*f**m*m**3*n*x*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144
*m**3 + 193*m**2 + 132*m + 36) - 10*b*d**2*f**m*m**3*n*x*x**m/(m**6 + 12*m*
*5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 47*b*d**2*f**m*m**3*x*x*
*m*log(c)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 9
7*b*d**2*f**m*m**2*n*x*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 1
93*m**2 + 132*m + 36) - 37*b*d**2*f**m*m**2*n*x*x**m/(m**6 + 12*m**5 + 58*m
**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 97*b*d**2*f**m*m**2*x*x**m*log(c)
/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 96*b*d**2*
f**m*m*n*x*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 13
2*m + 36) - 60*b*d**2*f**m*m*n*x*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3
+ 193*m**2 + 132*m + 36) + 96*b*d**2*f**m*m*x*x**m*log(c)/(m**6 + 12*m**5 +
 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 36*b*d**2*f**m*n*x*x**m*log(
x)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) - 36*b*d**
2*f**m*n*x*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 3
6) + 36*b*d**2*f**m*x*x**m*log(c)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 19
3*m**2 + 132*m + 36) + 2*b*d*e*f**m*m**5*n*x**2*x**m*log(x)/(m**6 + 12*m**5
 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 2*b*d*e*f**m*m**5*x**2*x**
m*log(c)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 20
*b*d*e*f**m*m**4*n*x**2*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 +
193*m**2 + 132*m + 36) - 2*b*d*e*f**m*m**4*n*x**2*x**m/(m**6 + 12*m**5 + 58
*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 20*b*d*e*f**m*m**4*x**2*x**m*lo
g(c)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 76*b*d
*e*f**m*m**3*n*x**2*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*
m**2 + 132*m + 36) - 16*b*d*e*f**m*m**3*n*x**2*x**m/(m**6 + 12*m**5 + 58*m*
*4 + 144*m**3 + 193*m**2 + 132*m + 36) + 76*b*d*e*f**m*m**3*x**2*x**m*log(c
)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 136*b*d*e
*f**m*m**2*n*x**2*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m*
*2 + 132*m + 36) - 44*b*d*e*f**m*m**2*n*x**2*x**m/(m**6 + 12*m**5 + 58*m**4
 + 144*m**3 + 193*m**2 + 132*m + 36) + 136*b*d*e*f**m*m**2*x**2*x**m*log(c)
```

```
/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 114*b*d*e*
f**m*m*n*x**2*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 +
 132*m + 36) - 48*b*d*e*f**m*m*n*x**2*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*
m**3 + 193*m**2 + 132*m + 36) + 114*b*d*e*f**m*m*x**2*x**m*log(c)/(m**6 + 1
2*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 36*b*d*e*f**m*n*x**2
*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36)
- 18*b*d*e*f**m*n*x**2*x**m/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2
 + 132*m + 36) + 36*b*d*e*f**m*x**2*x**m*log(c)/(m**6 + 12*m**5 + 58*m**4 +
 144*m**3 + 193*m**2 + 132*m + 36) + b*e**2*f**m*m**5*n*x**3*x**m*log(x)/(m
**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + b*e**2*f**m*m
**5*x**3*x**m*log(c)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*
m + 36) + 9*b*e**2*f**m*m**4*n*x**3*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 +
 144*m**3 + 193*m**2 + 132*m + 36) - b*e**2*f**m*m**4*n*x**3*x**m/(m**6 + 1
2*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 9*b*e**2*f**m*m**4*x
**3*x**m*log(c)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 3
6) + 31*b*e**2*f**m*m**3*n*x**3*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144
*m**3 + 193*m**2 + 132*m + 36) - 6*b*e**2*f**m*m**3*n*x**3*x**m/(m**6 + 12*
m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 31*b*e**2*f**m*m**3*x*
*3*x**m*log(c)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36
) + 51*b*e**2*f**m*m**2*n*x**3*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144*
m**3 + 193*m**2 + 132*m + 36) - 13*b*e**2*f**m*m**2*n*x**3*x**m/(m**6 + 12*
m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 51*b*e**2*f**m*m**2*x*
*3*x**m*log(c)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36
) + 40*b*e**2*f**m*m*n*x**3*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144*m**
3 + 193*m**2 + 132*m + 36) - 12*b*e**2*f**m*m*n*x**3*x**m/(m**6 + 12*m**5 +
 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 40*b*e**2*f**m*m*x**3*x**m*l
og(c)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36) + 12*b*
e**2*f**m*n*x**3*x**m*log(x)/(m**6 + 12*m**5 + 58*m**4 + 144*m**3 + 193*m**
2 + 132*m + 36) - 4*b*e**2*f**m*n*x**3*x**m/(m**6 + 12*m**5 + 58*m**4 + 144
*m**3 + 193*m**2 + 132*m + 36) + 12*b*e**2*f**m*x**3*x**m*log(c)/(m**6 + 12
*m**5 + 58*m**4 + 144*m**3 + 193*m**2 + 132*m + 36), True))
```

3.164 $\int (fx)^m(d+ex)\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=95

$$\frac{d(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{e(fx)^{m+2}\left(a+b\log\left(cx^n\right)\right)}{f^2(m+2)}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{ben(fx)^{m+2}}{f^2(m+2)^2}$$

```
[Out] -b*d*n*(f*x)^(1+m)/f/(1+m)^2-b*e*n*(f*x)^(2+m)/f^2/(2+m)^2+d*(f*x)^(1+m)*(a
+b*ln(c*x^n))/f/(1+m)+e*(f*x)^(2+m)*(a+b*ln(c*x^n))/f^2/(2+m)
```

Rubi [A] time = 0.08, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {43, 2350}

$$\frac{d(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{e(fx)^{m+2}\left(a+b\log\left(cx^n\right)\right)}{f^2(m+2)}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{ben(fx)^{m+2}}{f^2(m+2)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (b*e*n*(f*x)^(2 + m))/(f^2*(2 + m)
^2) + (d*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m)) + (e*(f*x)^(2 + m)*(
a + b*Log[c*x^n]))/(f^2*(2 + m))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\begin{aligned}\int (fx)^m(d+ex)\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{d(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}+\frac{e(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)}-(bn)\int (fx)^m\left(\right.\\ &= \frac{d(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}+\frac{e(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)}-(bn)\int \left(\frac{d(fx)^{m}}{1+m}\right.\\ &= -\frac{bdn(fx)^{1+m}}{f(1+m)^2}-\frac{ben(fx)^{2+m}}{f^2(2+m)^2}+\frac{d(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}+\frac{e(fx)^{2+m}\left(a\right.}{f^2(2}\end{aligned}$$

Mathematica [A] time = 0.07, size = 64, normalized size = 0.67

$$x(fx)^m\left(\frac{d\left(a+b\log\left(cx^n\right)\right)}{m+1}+\frac{ex\left(a+b\log\left(cx^n\right)\right)}{m+2}-\frac{bdn}{(m+1)^2}-\frac{benx}{(m+2)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d*n)/(1 + m)^2) - (b*e*n*x)/(2 + m)^2 + (d*(a + b*Log[c*x^n
]))/(1 + m) + (e*x*(a + b*Log[c*x^n]))/(2 + m))
```

fricas [B] time = 0.73, size = 235, normalized size = 2.47

$$\frac{\left(\left(aem^3 + 4\,aem^2 + 5\,aem + 2\,ae - \left(bem^2 + 2\,bem + be\right)n\right)x^2 + \left(adm^3 + 5\,adm^2 + 8\,adm + 4\,ad - \left(bdm^2 + 4\,bd\cdots\right.\right.\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e*m^3 + 4*a*e*m^2 + 5*a*e*m + 2*a*e - (b*e*m^2 + 2*b*e*m + b*e)*n)*x^2
+ (a*d*m^3 + 5*a*d*m^2 + 8*a*d*m + 4*a*d - (b*d*m^2 + 4*b*d*m + 4*b*d)*n)*x
 + ((b*e*m^3 + 4*b*e*m^2 + 5*b*e*m + 2*b*e)*x^2 + (b*d*m^3 + 5*b*d*m^2 + 8*
b*d*m + 4*b*d)*x)*log(c) + ((b*e*m^3 + 4*b*e*m^2 + 5*b*e*m + 2*b*e)*n*x^2 +
 (b*d*m^3 + 5*b*d*m^2 + 8*b*d*m + 4*b*d)*n*x)*log(x))*e^(m*log(f) + m*log(x
))/(m^4 + 6*m^3 + 13*m^2 + 12*m + 4)
```

giac [B] time = 0.37, size = 217, normalized size = 2.28

$$\frac{bf^m mnx^2x^m e\log(x)}{m^2+4\,m+4}+\frac{bdf^m mnxx^m\log(x)}{m^2+2\,m+1}+\frac{2\,bf^m nx^2x^m e\log(x)}{m^2+4\,m+4}-\frac{bf^m nx^2x^m e}{m^2+4\,m+4}+\frac{bf^m x^2x^m e\log(c)}{m+2}+\frac{bdf^m nxx\cdots}{m^2+2\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x^2*x^m*e*log(x)/(m^2 + 4*m + 4) + b*d*f^m*m*n*x*x^m*log(x)/(m^2
+ 2*m + 1) + 2*b*f^m*n*x^2*x^m*e*log(x)/(m^2 + 4*m + 4) - b*f^m*n*x^2*x^m*e
/(m^2 + 4*m + 4) + b*f^m*x^2*x^m*e*log(c)/(m + 2) + b*d*f^m*n*x*x^m*log(x)/
(m^2 + 2*m + 1) - b*d*f^m*n*x*x^m/(m^2 + 2*m + 1) + a*f^m*x^2*x^m*e/(m + 2)
 + (f*x)^m*b*d*x*log(c)/(m + 1) + (f*x)^m*a*d*x/(m + 1)
```

maple [C] time = 0.24, size = 1122, normalized size = 11.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] b*x*(e*m*x+d*m+e*x+2*d)/(m+1)/(m+2)*exp(1/2*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn
(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn
(I*f*x)^3+2*ln(f)+2*ln(x))*m)*ln(x^n)-1/2*x*(8*b*d*n-16*a*d*m-10*a*e*m*x-2*
ln(c)*b*d*m^3-10*ln(c)*b*d*m^2-16*ln(c)*b*d*m-10*a*d*m^2+I*Pi*b*e*m^3*x*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*a*d-2*a*e*m^3*x+2*b*d*m^2*n-4*b*e*x*ln(c
)-2*a*d*m^3-8*b*d*ln(c)+2*b*e*m^2*n*x+8*b*d*m*n+4*I*Pi*b*e*m^2*x*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)+5*I*Pi*b*d*m^2*csgn(I*c*x^n)^3+I*Pi*b*d*m^3*csgn(
I*c*x^n)^3+4*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d*m^3*csgn
(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*m^3*csgn(I*c*x^n)^2*csgn(I*c)+5*I*Pi*b*e*m
*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e*m^3*x*csgn(I*c*x^n)^3-8*a*e
*m^2*x+4*I*Pi*b*d*csgn(I*c*x^n)^3-8*ln(c)*b*e*m^2*x-10*ln(c)*b*e*m*x-2*ln(c
)*b*e*m^3*x+4*I*Pi*b*e*m^2*x*csgn(I*c*x^n)^3-5*I*Pi*b*d*m^2*csgn(I*x^n)*csg
n(I*c*x^n)^2-5*I*Pi*b*d*m^2*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*e*m^3*x*csgn(I
*x^n)*csgn(I*c*x^n)^2-4*I*Pi*b*e*m^2*x*csgn(I*x^n)*csgn(I*c*x^n)^2-4*I*Pi*b
*e*m^2*x*csgn(I*c*x^n)^2*csgn(I*c)+5*I*Pi*b*d*m^2*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-5*I*Pi*b*e*m*x*csgn(I*x^n)*csgn(I*c*x^n)^2-5*I*Pi*b*e*m*x*csgn(I
```

```
*c*x^n)^2*csgn(I*c)+8*I*Pi*b*d*m*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi
*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*e*m^3*x*csgn(I*c*x^n)^2*c
sgn(I*c)+I*Pi*b*d*m^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*I*Pi*b*d*m*csgn
(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*e*x
*csgn(I*c*x^n)^2*csgn(I*c)+4*b*e*m*n*x-4*a*e*x+2*b*e*n*x-4*I*Pi*b*d*csgn(I*
c*x^n)^2*csgn(I*c)+8*I*Pi*b*d*m*csgn(I*c*x^n)^3+2*I*Pi*b*e*x*csgn(I*c*x^n)^
3-4*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+5*I*Pi*b*e*m*x*csgn(I*c*x^n)^3-8*I
*Pi*b*d*m*csgn(I*x^n)*csgn(I*c*x^n)^2)/(m+2)^2/(m+1)^2*exp(1/2*(-I*Pi*csgn(
I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn
(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x))*m)
```

maxima [A] time = 0.64, size = 119, normalized size = 1.25

$$\frac{bef^m x^2 x^m \log\left(cx^n\right)}{m+2}+\frac{aef^m x^2 x^m}{m+2}-\frac{bef^m nx^2 x^m}{(m+2)^2}-\frac{bdf^m nxx^m}{(m+1)^2}+\frac{\left(fx\right)^{m+1} bd\log\left(cx^n\right)}{f(m+1)}+\frac{\left(fx\right)^{m+1} ad}{f(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] b*e*f^m*x^2*x^m*log(c*x^n)/(m + 2) + a*e*f^m*x^2*x^m/(m + 2) - b*e*f^m*n*x^
2*x^m/(m + 2)^2 - b*d*f^m*n*x*x^m/(m + 1)^2 + (f*x)^(m + 1)*b*d*log(c*x^n)/
(f*(m + 1)) + (f*x)^(m + 1)*a*d/(f*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(f\,x\right)^m\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,\left(d+e\,x\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a + b*log(c*x^n))*(d + e*x),x)
```

```
[Out] int((f*x)^m*(a + b*log(c*x^n))*(d + e*x), x)
```

sympy [A] time = 10.29, size = 1238, normalized size = 13.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise(((-a*d/x + a*e*log(x) + b*d*(-n/x - log(c*x**n)/x) - b*e*Piecewis
e((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True)))/f**2, Eq(m, -
2)), ((a*d*log(x) + a*e*x + b*d*n*log(x)**2/2 + b*d*log(c)*log(x) + b*e*n*x
*log(x) - b*e*n*x + b*e*x*log(c))/f, Eq(m, -1)), (a*d*f**m*m**3*x*x**m/(m**
4 + 6*m**3 + 13*m**2 + 12*m + 4) + 5*a*d*f**m*m**2*x*x**m/(m**4 + 6*m**3 +
13*m**2 + 12*m + 4) + 8*a*d*f**m*m*x*x**m/(m**4 + 6*m**3 + 13*m**2 + 12*m +
 4) + 4*a*d*f**m*x*x**m/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + a*e*f**m*m**
3*x**2*x**m/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + 4*a*e*f**m*m**2*x**2*x**
m/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + 5*a*e*f**m*m*x**2*x**m/(m**4 + 6*m
**3 + 13*m**2 + 12*m + 4) + 2*a*e*f**m*x**2*x**m/(m**4 + 6*m**3 + 13*m**2 +
 12*m + 4) + b*d*f**m*m**3*n*x*x**m*log(x)/(m**4 + 6*m**3 + 13*m**2 + 12*m
+ 4) + b*d*f**m*m**3*x*x**m*log(c)/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + 5
*b*d*f**m*m**2*n*x*x**m*log(x)/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) - b*d*f
**m*m**2*n*x*x**m/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + 5*b*d*f**m*m**2*x*
x**m*log(c)/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + 8*b*d*f**m*m*n*x*x**m*lo
g(x)/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) - 4*b*d*f**m*m*n*x*x**m/(m**4 + 6
*m**3 + 13*m**2 + 12*m + 4) + 8*b*d*f**m*m*x*x**m*log(c)/(m**4 + 6*m**3 + 1
3*m**2 + 12*m + 4) + 4*b*d*f**m*n*x*x**m*log(x)/(m**4 + 6*m**3 + 13*m**2 +
12*m + 4) - 4*b*d*f**m*n*x*x**m/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + 4*b*
```

```
d*f**m*x*x**m*log(c)/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + b*e*f**m*m**3*n
*x**2*x**m*log(x)/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + b*e*f**m*m**3*x**2
*x**m*log(c)/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + 4*b*e*f**m*m**2*n*x**2*
x**m*log(x)/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) - b*e*f**m*m**2*n*x**2*x**
m/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + 4*b*e*f**m*m**2*x**2*x**m*log(c)/(
m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + 5*b*e*f**m*m*n*x**2*x**m*log(x)/(m**4
 + 6*m**3 + 13*m**2 + 12*m + 4) - 2*b*e*f**m*m*n*x**2*x**m/(m**4 + 6*m**3 +
 13*m**2 + 12*m + 4) + 5*b*e*f**m*m*x**2*x**m*log(c)/(m**4 + 6*m**3 + 13*m*
*2 + 12*m + 4) + 2*b*e*f**m*n*x**2*x**m*log(x)/(m**4 + 6*m**3 + 13*m**2 + 1
2*m + 4) - b*e*f**m*n*x**2*x**m/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4) + 2*b*
e*f**m*x**2*x**m*log(c)/(m**4 + 6*m**3 + 13*m**2 + 12*m + 4), True))
```

3.165 $\int (fx)^m \left(a + b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=46

$$\frac{(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}-\frac{bn(fx)^{m+1}}{f(m+1)^2}$$

```
[Out] -b*n*(f*x)^(1+m)/f/(1+m)^2+(f*x)^(1+m)*(a+b*ln(c*x^n))/f/(1+m)
```

Rubi [A] time = 0.02, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {2304}

$$\frac{(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}-\frac{bn(fx)^{m+1}}{f(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*(f*x)^(1 + m))/(f*(1 + m)^2)) + ((f*x)^(1 + m)*(a + b*Log[c*x^n]))/(
f*(1 + m))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int (fx)^m\left(a+b\log\left(cx^n\right)\right)\,dx=-\frac{bn(fx)^{1+m}}{f(1+m)^2}+\frac{(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 0.70

$$\frac{x(fx)^m\left(am+a+b(m+1)\log\left(cx^n\right)-bn\right)}{(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] (x*(f*x)^m*(a + a*m - b*n + b*(1 + m)*Log[c*x^n]))/(1 + m)^2
```

fricas [A] time = 0.51, size = 52, normalized size = 1.13

$$\frac{\left((bm+b)nx\log(x)+(bm+b)x\log(c)+(am-bn+a)x\right)e^{\left(m\log(f)+m\log(x)\right)}}{m^2+2\,m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((b*m + b)*n*x*log(x) + (b*m + b)*x*log(c) + (a*m - b*n + a)*x)*e^(m*log(f)
 + m*log(x))/(m^2 + 2*m + 1)
```

giac [B] time = 0.36, size = 95, normalized size = 2.07

$$\frac{bf^{m}mnxx^{m}\log(x)}{m^{2}+2m+1}+\frac{bf^{m}nxx^{m}\log(x)}{m^{2}+2m+1}-\frac{bf^{m}nxx^{m}}{m^{2}+2m+1}+\frac{(fx)^{m}bx\log(c)}{m+1}+\frac{(fx)^{m}ax}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*n*x*x^m*log(x)/(m^2 + 2*m +
1) - b*f^m*n*x*x^m/(m^2 + 2*m + 1) + (f*x)^m*b*x*log(c)/(m + 1) + (f*x)^m*a
*x/(m + 1)
```

maple [C] time = 0.16, size = 371, normalized size = 8.07

$$\frac{bx\,\mathrm{e}^{\frac{\left(-i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ix)\mathrm{csgn}(ifx)+i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ifx)^{2}+i\pi\,\mathrm{csgn}(ix)\mathrm{csgn}(ifx)^{2}-i\pi\mathrm{csgn}(ifx)^{3}+2\ln(f)+2\ln(x)\right)m}{2}}\ln(x^{n})}{m+1}-\frac{\left(i\pi bm\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ix\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a),x)
```

```
[Out] b/(m+1)*x*exp(1/2*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csg
n(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x))
*m)*ln(x^n)-1/2*(I*Pi*b*m*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-I*Pi*b*m*csgn
(I*c)*csgn(I*c*x^n)^2-I*Pi*b*m*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*m*csgn(I*
c*x^n)^3+I*Pi*b*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-I*Pi*b*csgn(I*c)*csgn(I
*c*x^n)^2-I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*csgn(I*c*x^n)^3-2*b*m*l
n(c)-2*a*m+2*b*n-2*b*ln(c)-2*a)/(m+1)^2*x*exp(1/2*(-I*Pi*csgn(I*f)*csgn(I*x
)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*P
i*csgn(I*f*x)^3+2*ln(f)+2*ln(x))*m)
```

maxima [A] time = 0.67, size = 57, normalized size = 1.24

$$-\frac{bf^{m}nxx^{m}}{(m+1)^{2}}+\frac{(fx)^{m+1}b\log(cx^{n})}{f(m+1)}+\frac{(fx)^{m+1}a}{f(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -b*f^m*n*x*x^m/(m + 1)^2 + (f*x)^(m + 1)*b*log(c*x^n)/(f*(m + 1)) + (f*x)^(
m + 1)*a/(f*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int (f\,x)^{m}\,(a+b\,\ln(c\,x^{n}))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^m*(a + b*log(c*x^n)), x)
```

sympy [A] time = 10.18, size = 192, normalized size = 4.17

$$\begin{cases} \frac{af^m mxx^m}{m^2+2m+1} + \frac{af^m xx^m}{m^2+2m+1} + \frac{bf^m mnxx^m \log(x)}{m^2+2m+1} + \frac{bf^m mxx^m \log(c)}{m^2+2m+1} + \frac{bf^m nxx^m \log(x)}{m^2+2m+1} - \frac{bf^m nxx^m}{m^2+2m+1} + \frac{bf^m xx^m \log(c)}{m^2+2m+1} & \text{for } m \neq -1 \\ \frac{\begin{cases} a\log(x) & \text{for } b = 0 \\ -\left(-a - b\log(c)\right)\log(x) & \text{for } n = 0 \\ \frac{\left(-a-b\log(cx^n)\right)^2}{2bn} & \text{otherwise} \end{cases}}{f} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((a*f**m*m*x*x**m/(m**2 + 2*m + 1) + a*f**m*x*x**m/(m**2 + 2*m + 1
) + b*f**m*m*n*x*x**m*log(x)/(m**2 + 2*m + 1) + b*f**m*m*x*x**m*log(c)/(m**
2 + 2*m + 1) + b*f**m*n*x*x**m*log(x)/(m**2 + 2*m + 1) - b*f**m*n*x*x**m/(m
**2 + 2*m + 1) + b*f**m*x*x**m*log(c)/(m**2 + 2*m + 1), Ne(m, -1)), (Piecew
ise((a*log(x), Eq(b, 0)), (-(-a - b*log(c))*log(x), Eq(n, 0)), ((-a - b*log
(c*x**n))**2/(2*b*n), True))/f, True))
```

3.166 $\int \frac{(fx)^m(a+b\log(cx^n))}{d+ex}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex},x\right)$$

```
[Out] Unintegrable((f*x)^m*(a+b*ln(c*x^n))/(e*x+d),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x),x]
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x), x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex}\,dx=\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex}\,dx$$

Mathematica [A] time = 0.10, size = 72, normalized size = 2.77

$$\frac{x(fx)^m\left((m+1)\,{}_2F_1\left(1,m+1;m+2;-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\,{}_3F_2\left(1,m+1,m+1;m+2,m+2;-\frac{ex}{d}\right)\right)}{d(m+1)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x),x]
[Out] (x*(f*x)^m*(-(b*n*HypergeometricPFQ[{1, 1 + m, 1 + m}, {2 + m, 2 + m}, -((e
*x)/d)]) + (1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((e*x)/d)]*(a + b*Lo
g[c*x^n])))/(d*(1 + m)^2)
```

fricas [A] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(fx\right)^m b\log\left(cx^n\right)+\left(fx\right)^m a}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d),x, algorithm="fricas")
[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e*x + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)\left(fx\right)^m}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x + d), x)
```

maple [A] time = 0.62, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^{n})+a)\left(fx\right)^{m}}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x+d),x)
[Out] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x+d),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)\left(fx\right)^{m}}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d),x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x + d), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(f\,x\right)^{m}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x),x)
[Out] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(fx\right)^{m}\left(a+b\log\left(cx^{n}\right)\right)}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))/(e*x+d),x)
[Out] Integral((f*x)**m*(a + b*log(c*x**n))/(d + e*x), x)
```

3.167 $\int \frac{(fx)^m\left(a+b\log(cx^n)\right)}{(d+ex)^2}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2},x\right)$$

```
[Out] Unintegrable((f*x)^m*(a+b*ln(c*x^n))/(e*x+d)^2,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x)^2,x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x)^2, x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2}\,dx=\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2}\,dx$$

Mathematica [A] time = 0.11, size = 72, normalized size = 2.77

$$\frac{x(fx)^m\left((m+1)\,{}_2F_1\left(2,m+1;m+2;-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\,{}_3F_2\left(2,m+1,m+1;m+2,m+2;-\frac{ex}{d}\right)\right)}{d^2(m+1)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x)^2,x]
```

```
[Out] (x*(f*x)^m*(-(b*n*HypergeometricPFQ[{2, 1 + m, 1 + m}, {2 + m, 2 + m}, -((e
*x)/d)]) + (1 + m)*Hypergeometric2F1[2, 1 + m, 2 + m, -((e*x)/d)]*(a + b*Lo
g[c*x^n])))/(d^2*(1 + m)^2)
```

fricas [A] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(fx\right)^m b\log\left(cx^n\right)+\left(fx\right)^m a}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e^2*x^2 + 2*d*e*x + d^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)\left(fx\right)^m}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d)^2,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x + d)^2, x)
```

maple [A] time = 0.66, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n)+a)\left(fx\right)^m}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x+d)^2,x)
[Out] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x+d)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log(cx^n)+a\right)\left(fx\right)^m}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d)^2,x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x + d)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(f\,x\right)^m\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(d+e\,x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x)^2,x)
[Out] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(fx\right)^m\left(a+b\log(cx^n)\right)}{(d+ex)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))/(e*x+d)**2,x)
[Out] Integral((f*x)**m*(a + b*log(c*x**n))/(d + e*x)**2, x)
```

3.168 $\int x(a+bx)^m \log(cx^n)\,dx$

Optimal. Leaf size=18

$$\text{Int}\left(x(a+bx)^m\log(cx^n),x\right)$$

```
[Out] Unintegrable(x*(b*x+a)^m*ln(c*x^n),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x(a+bx)^m\log(cx^n)\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(a + b*x)^m*Log[c*x^n],x]
```

```
[Out] Defer[Int][x*(a + b*x)^m*Log[c*x^n], x]
```

Rubi steps

$$\int x(a+bx)^m\log(cx^n)\,dx=\int x(a+bx)^m\log(cx^n)\,dx$$

Mathematica [A] time = 0.25, size = 173, normalized size = 9.61

$$\frac{(a+bx)^m\left(\frac{bx}{a}+1\right)^{-m}\left(ab(m+2)nx\,{}_3F_2\left(1,1,-m-1;2,2;-\frac{bx}{a}\right)+\left(-a^2\left(\left(\frac{bx}{a}+1\right)^m-1\right)+b^2(m+1)x^2\left(\frac{bx}{a}+1\right)\right.\right.}{b^2(m+1)(m+2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(a + b*x)^m*Log[c*x^n],x]
```

```
[Out] ((a + b*x)^m*(-(n*(2*a*b*x*(1 + (b*x)/a)^m + b^2*x^2*(1 + (b*x)/a)^m + a^2*
(-1 + (1 + (b*x)/a)^m))) + a*b*(2 + m)*n*x*HypergeometricPFQ[{1, 1, -1 - m}
, {2, 2}, -((b*x)/a)] + (a*b*m*x*(1 + (b*x)/a)^m + b^2*(1 + m)*x^2*(1 + (b*
x)/a)^m - a^2*(-1 + (1 + (b*x)/a)^m))*Log[c*x^n]))/(b^2*(1 + m)*(2 + m)*(1
+ (b*x)/a)^m)
```

fricas [A] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\left((bx+a)^m x\log(cx^n),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(b*x+a)^m*log(c*x^n),x, algorithm="fricas")
```

```
[Out] integral((b*x + a)^m*x*log(c*x^n), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int(bx+a)^m x\log(cx^n)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(b*x+a)^m*log(c*x^n),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^m*x*log(c*x^n), x)
```

maple [A] time = 0.65, size = 0, normalized size = 0.00

$$\int x\left(bx+a\right)^{m}\ln\left(c\,x^{n}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*x+a)^m*ln(c*x^n),x)
```

```
[Out] int(x*(b*x+a)^m*ln(c*x^n),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(b^{2}(m+1)x^{2}+abmx-a^{2}\right)(bx+a)^{m}\log\left(x^{n}\right)}{\left(m^{2}+3\,m+2\right)b^{2}}+\frac{-\frac{(bx+a)^{m+1}amn}{m+1}+\int-\frac{\left(\left(mn-\left(m^{2}+3\,m+2\right)\log(c)+n\right)b^{2}x^{2}-a^{2}n\right)(bx+a)^{m}}{x}\,dx}{\left(m^{2}+3\,m+2\right)b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(b*x+a)^m*log(c*x^n),x, algorithm="maxima")
```

```
[Out] (b^2*(m + 1)*x^2 + a*b*m*x - a^2)*(b*x + a)^m*log(x^n)/((m^2 + 3*m + 2)*b^2
) + integrate(-(a*b*m*n*x + (m*n - (m^2 + 3*m + 2)*log(c) + n)*b^2*x^2 - a^
2*n)*(b*x + a)^m/x, x)/((m^2 + 3*m + 2)*b^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int x\,\ln\left(c\,x^{n}\right)\,{\left(a+b\,x\right)}^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*log(c*x^n)*(a + b*x)^m,x)
```

```
[Out] int(x*log(c*x^n)*(a + b*x)^m, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x\left(a+bx\right)^{m}\log\left(cx^{n}\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(b*x+a)**m*ln(c*x**n),x)
```

```
[Out] Integral(x*(a + b*x)**m*log(c*x**n), x)
```

3.169 $\int (a+bx)^m \log(cx^n)\, dx$

Optimal. Leaf size=68

$$\frac{(a+bx)^{m+1}\log(cx^n)}{b(m+1)}+\frac{n(a+bx)^{m+2}\,{}_2F_1\left(1,m+2;m+3;\frac{bx}{a}+1\right)}{ab\left(m^2+3m+2\right)}$$

```
[Out] n*(b*x+a)^(2+m)*hypergeom([1, 2+m],[3+m],1+b*x/a)/a/b/(m^2+3*m+2)+(b*x+a)^(
1+m)*ln(c*x^n)/b/(1+m)
```

Rubi [A] time = 0.03, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2319, 65}

$$\frac{(a+bx)^{m+1}\log(cx^n)}{b(m+1)}+\frac{n(a+bx)^{m+2}\,{}_2F_1\left(1,m+2;m+3;\frac{bx}{a}+1\right)}{ab\left(m^2+3m+2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^m*Log[c*x^n],x]
```

```
[Out] (n*(a + b*x)^(2 + m)*Hypergeometric2F1[1, 2 + m, 3 + m, 1 + (b*x)/a])/(a*b*
(2 + 3*m + m^2)) + ((a + b*x)^(1 + m)*Log[c*x^n])/(b*(1 + m))
```

Rule 65

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((c + d*x
)^(n + 1)*Hypergeometric2F1[-m, n + 1, n + 2, 1 + (d*x)/c])/(d*(n + 1)*(-(d
/(b*c)))^m), x] /; FreeQ[{b, c, d, m, n}, x] && !IntegerQ[n] && (IntegerQ[
m] || GtQ[-(d/(b*c)), 0])
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] && !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rubi steps

$$\begin{aligned}\int (a+bx)^m\log(cx^n)\,dx&=\frac{(a+bx)^{1+m}\log(cx^n)}{b(1+m)}-\frac{n\int\frac{(a+bx)^{1+m}}{x}\,dx}{b(1+m)}\\&=\frac{n(a+bx)^{2+m}\,{}_2F_1\left(1,2+m;3+m;1+\frac{bx}{a}\right)}{ab\left(2+3m+m^2\right)}+\frac{(a+bx)^{1+m}\log(cx^n)}{b(1+m)}\end{aligned}$$

Mathematica [A] time = 0.02, size = 61, normalized size = 0.90

$$\frac{(a+bx)^{m+1}\left(n(a+bx)\,{}_2F_1\left(1,m+2;m+3;\frac{bx}{a}+1\right)+a(m+2)\log(cx^n)\right)}{ab(m+1)(m+2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^m*Log[c*x^n],x]
```

```
[Out] ((a + b*x)^(1 + m)*(n*(a + b*x)*Hypergeometric2F1[1, 2 + m, 3 + m, 1 + (b*x
)/a] + a*(2 + m)*Log[c*x^n]))/(a*b*(1 + m)*(2 + m))
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\text{integral}\left((bx+a)^m \log(cx^n), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*log(c*x^n),x, algorithm="fricas")
```

```
[Out] integral((b*x + a)^m*log(c*x^n), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^m \log(cx^n)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*log(c*x^n),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^m*log(c*x^n), x)
```

maple [F] time = 0.54, size = 0, normalized size = 0.00

$$\int (bx+a)^m \ln(c\,x^n)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^m*ln(c*x^n),x)
```

```
[Out] int((b*x+a)^m*ln(c*x^n),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{(bx+a)(bx+a)^m \log(x^n)}{b(m+1)} + \frac{-an\int \frac{(bx+a)^m}{x}\, dx + \frac{(bx+a)^{m+1} m \log(c)}{m+1} - \frac{(bx+a)^{m+1} n}{m+1} + \frac{(bx+a)^{m+1} \log(c)}{m+1}}{b(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*log(c*x^n),x, algorithm="maxima")
```

```
[Out] (b*x + a)*(b*x + a)^m*log(x^n)/(b*(m + 1)) + integrate((((m + 1)*log(c) - n
)*b*x - a*n)*(b*x + a)^m/x, x)/(b*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \ln(c\,x^n)\,(a+b\,x)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(c*x^n)*(a + b*x)^m,x)
```

```
[Out] int(log(c*x^n)*(a + b*x)^m, x)
```

sympy [A] time = 27.79, size = 233, normalized size = 3.43

$$-n\left(\begin{cases} a^m x & \text{for } (b=0 \wedge m \neq - \\ -\frac{b^2 b^m m\left(\frac{a}{b}+x\right)^2\left(\frac{a}{b}+x\right)^m \Phi\left(1+\frac{bx}{a},1,m+2\right)\Gamma(m+2)}{abm\Gamma(m+3)+ab\Gamma(m+3)} - \frac{2b^2 b^m\left(\frac{a}{b}+x\right)^2\left(\frac{a}{b}+x\right)^m \Phi\left(1+\frac{bx}{a},1,m+2\right)\Gamma(m+2)}{abm\Gamma(m+3)+ab\Gamma(m+3)} & \text{for } m > -\infty \wedge m < \\ \frac{\begin{cases} \log(a)\log(x) - \text{Li}_2\left(\frac{bxe^{i\pi}}{a}\right) & \text{for } |x| < 1 \\ -\log(a)\log\left(\frac{1}{x}\right) - \text{Li}_2\left(\frac{bxe^{i\pi}}{a}\right) & \text{for } \frac{1}{|x|} < 1 \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix} \middle| x\right)\log(a) + G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix} \middle| x\right)\log(a) - \text{Li}_2\left(\frac{bxe^{i\pi}}{a}\right) & \text{otherwise} \end{cases}}{b} & \text{otherwise} \end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**m*ln(c*x**n),x)
```

```
[Out] -n*Piecewise((a**m*x, Eq(b, 0) | (Eq(b, 0) & Ne(m, -1))), (-b**2*b**m*m*(a/
b + x)**2*(a/b + x)**m*lerchphi(1 + b*x/a, 1, m + 2)*gamma(m + 2)/(a*b*m*ga
mma(m + 3) + a*b*gamma(m + 3)) - 2*b**2*b**m*(a/b + x)**2*(a/b + x)**m*lerc
hphi(1 + b*x/a, 1, m + 2)*gamma(m + 2)/(a*b*m*gamma(m + 3) + a*b*gamma(m +
3)), (m > -oo) & (m < oo) & Ne(m, -1)), (Piecewise((log(a)*log(x) - polylog
(2, b*x*exp_polar(I*pi)/a), Abs(x) < 1), (-log(a)*log(1/x) - polylog(2, b*x
*exp_polar(I*pi)/a), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x
)*log(a) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(a) - polylog(2, b*x*e
xp_polar(I*pi)/a), True))/b, True)) + Piecewise((a**m*x, Eq(b, 0)), (Piecew
ise(((a + b*x)**(m + 1)/(m + 1), Ne(m, -1)), (log(a + b*x), True))/b, True)
)*log(c*x**n)
```

3.170 $\int \frac{(a+bx)^m \log(cx^n)}{x} \, dx$

Optimal. Leaf size=20

$$\text{Int}\left(\frac{(a+bx)^m \log(cx^n)}{x}, x\right)$$

```
[Out] Unintegrable((b*x+a)^m*ln(c*x^n)/x,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(a+bx)^m \log(cx^n)}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[((a + b*x)^m*Log[c*x^n])/x,x]
```

```
[Out] Defer[Int][((a + b*x)^m*Log[c*x^n])/x, x]
```

Rubi steps

$$\int \frac{(a+bx)^m \log(cx^n)}{x} \, dx = \int \frac{(a+bx)^m \log(cx^n)}{x} \, dx$$

Mathematica [A] time = 0.06, size = 89, normalized size = 4.45

$$\frac{\left(\frac{a}{bx}+1\right)^{-m} (a+bx)^m \left(m \log(cx^n)\, {}_2F_1\left(-m,-m;1-m;-\frac{a}{bx}\right) - n\, {}_3F_2\left(-m,-m,-m;1-m,1-m;-\frac{a}{bx}\right)\right)}{m^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((a + b*x)^m*Log[c*x^n])/x,x]
```

```
[Out] ((a + b*x)^m*(-(n*HypergeometricPFQ[{-m, -m, -m}, {1 - m, 1 - m}, -(a/(b*x)
)]) + m*Hypergeometric2F1[-m, -m, 1 - m, -(a/(b*x))]*Log[c*x^n]))/(m^2*(1 +
 a/(b*x))^m)
```

fricas [A] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(bx+a)^m \log(cx^n)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*log(c*x^n)/x,x, algorithm="fricas")
```

```
[Out] integral((b*x + a)^m*log(c*x^n)/x, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*log(c*x^n)/x,x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError >> An error occurred running a Giac command:
INPUT:sage2OUTPUT:Simplification assuming a near 0Simplification assuming a
```

```
 near 0Unable to divide, perhaps due to rounding error%%%{1,[0,1,0]%%%} / %
%%{1,[0,0,1]%%%} Error: Bad Argument Value
```

maple [A] time = 0.56, size = 0, normalized size = 0.00

$$\int \frac{(bx+a)^m \ln(c\,x^n)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^m*ln(c*x^n)/x,x)
```

```
[Out] int((b*x+a)^m*ln(c*x^n)/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(bx+a)^m \log(cx^n)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*log(c*x^n)/x,x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^m*log(c*x^n)/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\ln(c\,x^n)\,(a+b\,x)^m}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((log(c*x^n)*(a + b*x)^m)/x,x)
```

```
[Out] int((log(c*x^n)*(a + b*x)^m)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+bx)^m \log(cx^n)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**m*ln(c*x**n)/x,x)
```

```
[Out] Integral((a + b*x)**m*log(c*x**n)/x, x)
```

3.171 $\int x^5 \left(d+ex^2\right) \left(a+b\log\left(cx^n\right)\right) \, dx$

Optimal. Leaf size=48

$$\frac{1}{24}\left(4dx^6+3ex^8\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{36}bdnx^6-\frac{1}{64}benx^8$$

```
[Out] -1/36*b*d*n*x^6-1/64*b*e*n*x^8+1/24*(3*e*x^8+4*d*x^6)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.04, antiderivative size = 48, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$\frac{1}{24}\left(4dx^6+3ex^8\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{36}bdnx^6-\frac{1}{64}benx^8$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^6)/36 - (b*e*n*x^8)/64 + ((4*d*x^6 + 3*e*x^8)*(a + b*Log[c*x^n]))
/24
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int x^5\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{24}\left(4dx^6+3ex^8\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(\frac{dx^5}{6}+\frac{ex^7}{8}\right)dx\\ &= -\frac{1}{36}bdnx^6-\frac{1}{64}benx^8+\frac{1}{24}\left(4dx^6+3ex^8\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 69, normalized size = 1.44

$$\frac{1}{6}adx^6+\frac{1}{8}aex^8+\frac{1}{6}bdx^6\log\left(cx^n\right)+\frac{1}{8}bex^8\log\left(cx^n\right)-\frac{1}{36}bdnx^6-\frac{1}{64}benx^8$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (a*d*x^6)/6 - (b*d*n*x^6)/36 + (a*e*x^8)/8 - (b*e*n*x^8)/64 + (b*d*x^6*Log[
c*x^n])/6 + (b*e*x^8*Log[c*x^n])/8
```

fricas [A] time = 0.78, size = 69, normalized size = 1.44

$$-\frac{1}{64}\,(ben-8\,ae)x^8-\frac{1}{36}\,(bdn-6\,ad)x^6+\frac{1}{24}\left(3\,bex^8+4\,bdx^6\right)\log(c)+\frac{1}{24}\left(3\,benx^8+4\,bdnx^6\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/64*(b*e*n - 8*a*e)*x^8 - 1/36*(b*d*n - 6*a*d)*x^6 + 1/24*(3*b*e*x^8 + 4*
b*d*x^6)*log(c) + 1/24*(3*b*e*n*x^8 + 4*b*d*n*x^6)*log(x)
```

giac [A] time = 0.36, size = 73, normalized size = 1.52

$$\frac{1}{8}\,bnx^8e\log(x)-\frac{1}{64}\,bnx^8e+\frac{1}{8}\,bx^8e\log(c)+\frac{1}{8}\,ax^8e+\frac{1}{6}\,bdnx^6\log(x)-\frac{1}{36}\,bdnx^6+\frac{1}{6}\,bdx^6\log(c)+\frac{1}{6}\,adx^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/8*b*n*x^8*e*log(x) - 1/64*b*n*x^8*e + 1/8*b*x^8*e*log(c) + 1/8*a*x^8*e +
1/6*b*d*n*x^6*log(x) - 1/36*b*d*n*x^6 + 1/6*b*d*x^6*log(c) + 1/6*a*d*x^6
```

maple [C] time = 0.21, size = 266, normalized size = 5.54

$$-\frac{i\pi be\,x^8\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{16}+\frac{i\pi be\,x^8\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{16}+\frac{i\pi be\,x^8\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{16}-\frac{i\pi be}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(e*x^2+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/24*b*x^6*(3*e*x^2+4*d)*ln(x^n)+1/16*I*Pi*b*e*x^8*csgn(I*x^n)*csgn(I*c*x^n
)^2-1/16*I*Pi*b*e*x^8*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/16*I*Pi*b*e*x^8
*csgn(I*c*x^n)^3+1/16*I*Pi*b*e*x^8*csgn(I*c*x^n)^2*csgn(I*c)+1/8*ln(c)*b*e*
x^8-1/64*b*e*n*x^8+1/8*a*e*x^8+1/12*I*Pi*b*d*x^6*csgn(I*x^n)*csgn(I*c*x^n)^
2-1/12*I*Pi*b*d*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/12*I*Pi*b*d*x^6*c
sgn(I*c*x^n)^3+1/12*I*Pi*b*d*x^6*csgn(I*c*x^n)^2*csgn(I*c)+1/6*ln(c)*b*d*x^
6-1/36*b*d*n*x^6+1/6*a*d*x^6
```

maxima [A] time = 0.47, size = 57, normalized size = 1.19

$$-\frac{1}{64}\,benx^8+\frac{1}{8}\,bex^8\log\left(cx^n\right)+\frac{1}{8}\,aex^8-\frac{1}{36}\,bdnx^6+\frac{1}{6}\,bdx^6\log\left(cx^n\right)+\frac{1}{6}\,adx^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/64*b*e*n*x^8 + 1/8*b*e*x^8*log(c*x^n) + 1/8*a*e*x^8 - 1/36*b*d*n*x^6 + 1
/6*b*d*x^6*log(c*x^n) + 1/6*a*d*x^6
```

mupad [B] time = 3.42, size = 51, normalized size = 1.06

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^8}{8}+\frac{b\,d\,x^6}{6}\right)+\frac{d\,x^6\,\left(6\,a-b\,n\right)}{36}+\frac{e\,x^8\,\left(8\,a-b\,n\right)}{64}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d + e*x^2)*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d*x^6)/6 + (b*e*x^8)/8) + (d*x^6*(6*a - b*n))/36 + (e*x^8*(8
*a - b*n))/64
```

sympy [B] time = 9.20, size = 87, normalized size = 1.81

$$\frac{adx^6}{6}+\frac{aex^8}{8}+\frac{bdnx^6\log\left(x\right)}{6}-\frac{bdnx^6}{36}+\frac{bdx^6\log\left(c\right)}{6}+\frac{benx^8\log\left(x\right)}{8}-\frac{benx^8}{64}+\frac{bex^8\log\left(c\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**6/6 + a*e*x**8/8 + b*d*n*x**6*log(x)/6 - b*d*n*x**6/36 + b*d*x**6*lo
g(c)/6 + b*e*n*x**8*log(x)/8 - b*e*n*x**8/64 + b*e*x**8*log(c)/8
```

3.172 $\int x^3 \left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=48

$$\frac{1}{12}\left(3dx^4+2ex^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bdnx^4-\frac{1}{36}benx^6$$

```
[Out] -1/16*b*d*n*x^4-1/36*b*e*n*x^6+1/12*(2*e*x^6+3*d*x^4)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.04, antiderivative size = 48, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$\frac{1}{12}\left(3dx^4+2ex^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bdnx^4-\frac{1}{36}benx^6$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^4)/16 - (b*e*n*x^6)/36 + ((3*d*x^4 + 2*e*x^6)*(a + b*Log[c*x^n]))
/12
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int x^3\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)\,dx&=\frac{1}{12}\left(3dx^4+2ex^6\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(\frac{dx^3}{4}+\frac{ex^5}{6}\right)\,dx\\&=-\frac{1}{16}bdnx^4-\frac{1}{36}benx^6+\frac{1}{12}\left(3dx^4+2ex^6\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 69, normalized size = 1.44

$$\frac{1}{4}adx^4+\frac{1}{6}aex^6+\frac{1}{4}bdx^4\log\left(cx^n\right)+\frac{1}{6}bex^6\log\left(cx^n\right)-\frac{1}{16}bdnx^4-\frac{1}{36}benx^6$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (a*d*x^4)/4 - (b*d*n*x^4)/16 + (a*e*x^6)/6 - (b*e*n*x^6)/36 + (b*d*x^4*Log[
c*x^n])/4 + (b*e*x^6*Log[c*x^n])/6
```

fricas [A] time = 0.43, size = 69, normalized size = 1.44

$$-\frac{1}{36}\left(ben-6\,ae\right)x^6-\frac{1}{16}\left(bdn-4\,ad\right)x^4+\frac{1}{12}\left(2\,bex^6+3\,bdx^4\right)\log(c)+\frac{1}{12}\left(2\,benx^6+3\,bdnx^4\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/36*(b*e*n - 6*a*e)*x^6 - 1/16*(b*d*n - 4*a*d)*x^4 + 1/12*(2*b*e*x^6 + 3*
b*d*x^4)*log(c) + 1/12*(2*b*e*n*x^6 + 3*b*d*n*x^4)*log(x)
```

giac [A] time = 0.27, size = 73, normalized size = 1.52

$$\frac{1}{6}bnx^6e\log(x)-\frac{1}{36}bnx^6e+\frac{1}{6}bx^6e\log(c)+\frac{1}{6}ax^6e+\frac{1}{4}bdnx^4\log(x)-\frac{1}{16}bdnx^4+\frac{1}{4}bdx^4\log(c)+\frac{1}{4}adx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/6*b*n*x^6*e*log(x) - 1/36*b*n*x^6*e + 1/6*b*x^6*e*log(c) + 1/6*a*x^6*e +
1/4*b*d*n*x^4*log(x) - 1/16*b*d*n*x^4 + 1/4*b*d*x^4*log(c) + 1/4*a*d*x^4
```

maple [C] time = 0.21, size = 266, normalized size = 5.54

$$-\frac{i\pi be\,x^6\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)}{12}+\frac{i\pi be\,x^6\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ic\,x^n)^2}{12}+\frac{i\pi be\,x^6\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)^2}{12}-\frac{i\pi be\,x^6}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/12*b*x^4*(2*e*x^2+3*d)*ln(x^n)+1/12*I*Pi*b*e*x^6*csgn(I*x^n)*csgn(I*c*x^n
)^2-1/12*I*Pi*b*e*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/12*I*Pi*b*e*x^6
*csgn(I*c*x^n)^3+1/12*I*Pi*b*e*x^6*csgn(I*c*x^n)^2*csgn(I*c)+1/6*ln(c)*b*e*
x^6-1/36*b*e*n*x^6+1/6*a*e*x^6+1/8*I*Pi*b*d*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2
-1/8*I*Pi*b*d*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/8*I*Pi*b*d*x^4*csgn
(I*c*x^n)^3+1/8*I*Pi*b*d*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*b*d*x^4*ln(c)-1/
16*b*d*n*x^4+1/4*a*d*x^4
```

maxima [A] time = 0.46, size = 57, normalized size = 1.19

$$-\frac{1}{36}\,benx^6+\frac{1}{6}\,bex^6\log\left(cx^n\right)+\frac{1}{6}\,aex^6-\frac{1}{16}\,bdnx^4+\frac{1}{4}\,bdx^4\log\left(cx^n\right)+\frac{1}{4}\,adx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/36*b*e*n*x^6 + 1/6*b*e*x^6*log(c*x^n) + 1/6*a*e*x^6 - 1/16*b*d*n*x^4 + 1
/4*b*d*x^4*log(c*x^n) + 1/4*a*d*x^4
```

mupad [B] time = 3.39, size = 51, normalized size = 1.06

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^6}{6}+\frac{b\,d\,x^4}{4}\right)+\frac{d\,x^4\,\left(4\,a-b\,n\right)}{16}+\frac{e\,x^6\,\left(6\,a-b\,n\right)}{36}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d + e*x^2)*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d*x^4)/4 + (b*e*x^6)/6) + (d*x^4*(4*a - b*n))/16 + (e*x^6*(6
*a - b*n))/36
```

sympy [B] time = 3.67, size = 87, normalized size = 1.81

$$\frac{adx^4}{4}+\frac{aex^6}{6}+\frac{bdnx^4\log\left(x\right)}{4}-\frac{bdnx^4}{16}+\frac{bdx^4\log\left(c\right)}{4}+\frac{benx^6\log\left(x\right)}{6}-\frac{benx^6}{36}+\frac{bex^6\log\left(c\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**4/4 + a*e*x**6/6 + b*d*n*x**4*log(x)/4 - b*d*n*x**4/16 + b*d*x**4*lo
g(c)/4 + b*e*n*x**6*log(x)/6 - b*e*n*x**6/36 + b*e*x**6*log(c)/6
```

3.173 $\int x\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=47

$$\frac{1}{4}\left(2dx^2+ex^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bdnx^2-\frac{1}{16}benx^4$$

```
[Out] -1/4*b*d*n*x^2-1/16*b*e*n*x^4+1/4*(e*x^4+2*d*x^2)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.04, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {14, 2334, 12}

$$\frac{1}{4}\left(2dx^2+ex^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bdnx^2-\frac{1}{16}benx^4$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^2)/4 - (b*e*n*x^4)/16 + ((2*d*x^2 + e*x^4)*(a + b*Log[c*x^n]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int x\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{4}\left(2dx^2+ex^4\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{1}{4}x\left(2d+ex^2\right)\,dx\\
&= \frac{1}{4}\left(2dx^2+ex^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(bn)\int x\left(2d+ex^2\right)\,dx\\
&= \frac{1}{4}\left(2dx^2+ex^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(bn)\int \left(2dx+ex^3\right)\,dx\\
&= -\frac{1}{4}bdnx^2-\frac{1}{16}benx^4+\frac{1}{4}\left(2dx^2+ex^4\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.00, size = 69, normalized size = 1.47

$$\frac{1}{2}adx^2+\frac{1}{4}aex^4+\frac{1}{2}bdx^2\log\left(cx^n\right)+\frac{1}{4}bex^4\log\left(cx^n\right)-\frac{1}{4}bdnx^2-\frac{1}{16}benx^4$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (a*d*x^2)/2 - (b*d*n*x^2)/4 + (a*e*x^4)/4 - (b*e*n*x^4)/16 + (b*d*x^2*Log[c
*x^n])/2 + (b*e*x^4*Log[c*x^n])/4
```

fricas [A] time = 0.51, size = 67, normalized size = 1.43

$$-\frac{1}{16}(ben-4\,ae)x^4-\frac{1}{4}(bdn-2\,ad)x^2+\frac{1}{4}\left(bex^4+2\,bdx^2\right)\log(c)+\frac{1}{4}\left(benx^4+2\,bdnx^2\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/16*(b*e*n - 4*a*e)*x^4 - 1/4*(b*d*n - 2*a*d)*x^2 + 1/4*(b*e*x^4 + 2*b*d*
x^2)*log(c) + 1/4*(b*e*n*x^4 + 2*b*d*n*x^2)*log(x)
```

giac [A] time = 0.36, size = 73, normalized size = 1.55

$$\frac{1}{4}bnx^4e\log(x)-\frac{1}{16}bnx^4e+\frac{1}{4}bx^4e\log(c)+\frac{1}{4}ax^4e+\frac{1}{2}bdnx^2\log(x)-\frac{1}{4}bdnx^2+\frac{1}{2}bdx^2\log(c)+\frac{1}{2}adx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/4*b*n*x^4*e*log(x) - 1/16*b*n*x^4*e + 1/4*b*x^4*e*log(c) + 1/4*a*x^4*e +
1/2*b*d*n*x^2*log(x) - 1/4*b*d*n*x^2 + 1/2*b*d*x^2*log(c) + 1/2*a*d*x^2
```

maple [C] time = 0.22, size = 265, normalized size = 5.64

$$-\frac{i\pi be\,x^4\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{8}+\frac{i\pi be\,x^4\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{8}+\frac{i\pi be\,x^4\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{8}-\frac{i\pi be}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/4*b*x^2*(e*x^2+2*d)*ln(x^n)+1/8*I*Pi*b*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-
1/8*I*Pi*b*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/8*I*Pi*b*e*x^4*csgn(
I*c*x^n)^3+1/8*I*Pi*b*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*b*e*x^4*ln(c)-1/1
6*b*e*n*x^4+1/4*a*e*x^4+1/4*I*Pi*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*
Pi*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4*I*Pi*b*d*x^2*csgn(I*c*x^
n)^3+1/4*I*Pi*b*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/2*b*d*x^2*ln(c)-1/4*b*d*n
*x^2+1/2*a*d*x^2
```

maxima [A] time = 0.47, size = 57, normalized size = 1.21

$$-\frac{1}{16}benx^4+\frac{1}{4}bex^4\log\left(cx^n\right)+\frac{1}{4}aex^4-\frac{1}{4}bdnx^2+\frac{1}{2}bdx^2\log\left(cx^n\right)+\frac{1}{2}adx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/16*b*e*n*x^4 + 1/4*b*e*x^4*log(c*x^n) + 1/4*a*e*x^4 - 1/4*b*d*n*x^2 + 1/
2*b*d*x^2*log(c*x^n) + 1/2*a*d*x^2
```

mupad [B] time = 3.39, size = 51, normalized size = 1.09

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^4}{4}+\frac{b\,d\,x^2}{2}\right)+\frac{d\,x^2\,\left(2\,a-b\,n\right)}{4}+\frac{e\,x^4\,\left(4\,a-b\,n\right)}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d + e*x^2)*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d*x^2)/2 + (b*e*x^4)/4) + (d*x^2*(2*a - b*n))/4 + (e*x^4*(4*
a - b*n))/16
```

sympy [B] time = 1.44, size = 87, normalized size = 1.85

$$\frac{adx^2}{2} + \frac{aex^4}{4} + \frac{bdnx^2\log(x)}{2} - \frac{bdnx^2}{4} + \frac{bdx^2\log(c)}{2} + \frac{benx^4\log(x)}{4} - \frac{benx^4}{16} + \frac{bex^4\log(c)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**2/2 + a*e*x**4/4 + b*d*n*x**2*log(x)/2 - b*d*n*x**2/4 + b*d*x**2*log
(c)/2 + b*e*n*x**4*log(x)/4 - b*e*n*x**4/16 + b*e*x**4*log(c)/4
```

3.174 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=52

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+\frac{1}{2}ex^2\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}benx^2$$

```
[Out] -1/4*b*e*n*x^2+1/2*e*x^2*(a+b*ln(c*x^n))+1/2*d*(a+b*ln(c*x^n))^2/b/n
```

Rubi [A] time = 0.06, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {14, 2351, 2301, 2304}

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+\frac{1}{2}ex^2\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}benx^2$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -(b*e*n*x^2)/4 + (e*x^2*(a + b*Log[c*x^n]))/2 + (d*(a + b*Log[c*x^n])^2)/(2
*b*n)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rubi steps

$$\begin{aligned}\int \frac{\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)}{x}\,dx&=\int \left(\frac{d\left(a+b\log\left(cx^n\right)\right)}{x}+ex\left(a+b\log\left(cx^n\right)\right)\right)dx\\&=d\int \frac{a+b\log\left(cx^n\right)}{x}\,dx+e\int x\left(a+b\log\left(cx^n\right)\right)dx\\&=-\frac{1}{4}benx^2+\frac{1}{2}ex^2\left(a+b\log\left(cx^n\right)\right)+\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}\end{aligned}$$

Mathematica [A] time = 0.00, size = 57, normalized size = 1.10

$$ad\log(x) + \frac{1}{2}aex^2 + \frac{bd\log^2(cx^n)}{2n} + \frac{1}{2}bex^2\log(cx^n) - \frac{1}{4}benx^2$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (a*e*x^2)/2 - (b*e*n*x^2)/4 + a*d*Log[x] + (b*e*x^2*Log[c*x^n])/2 + (b*d*Lo
g[c*x^n]^2)/(2*n)
```

fricas [A] time = 0.55, size = 55, normalized size = 1.06

$$\frac{1}{2}bex^2\log(c) + \frac{1}{2}bdn\log(x)^2 - \frac{1}{4}(ben - 2ae)x^2 + \frac{1}{2}\left(benx^2 + 2bd\log(c) + 2ad\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/2*b*e*x^2*log(c) + 1/2*b*d*n*log(x)^2 - 1/4*(b*e*n - 2*a*e)*x^2 + 1/2*(b*
e*n*x^2 + 2*b*d*log(c) + 2*a*d)*log(x)
```

giac [A] time = 0.32, size = 60, normalized size = 1.15

$$\frac{1}{2}bnx^2e\log(x) - \frac{1}{4}bnx^2e + \frac{1}{2}bx^2e\log(c) + \frac{1}{2}bdn\log(x)^2 + \frac{1}{2}ax^2e + bd\log(c)\log(x) + ad\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*n*x^2*e*log(x) - 1/4*b*n*x^2*e + 1/2*b*x^2*e*log(c) + 1/2*b*d*n*log(x
)^2 + 1/2*a*x^2*e + b*d*log(c)*log(x) + a*d*log(x)
```

maple [C] time = 0.27, size = 257, normalized size = 4.94

$$-\frac{i\pi be\,x^2\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)}{4} + \frac{i\pi be\,x^2\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2}{4} + \frac{i\pi be\,x^2\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)^2}{4} - \frac{i\pi be\,x^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] (1/2*e*b*x^2+b*d*ln(x))*ln(x^n)-1/2*b*d*n*ln(x)^2+1/4*I*Pi*b*e*x^2*csgn(I*x
^n)*csgn(I*c*x^n)^2-1/4*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/
4*I*Pi*b*e*x^2*csgn(I*c*x^n)^3+1/4*I*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1
/2*b*e*x^2*ln(c)-1/4*b*e*n*x^2+1/2*a*e*x^2+1/2*I*ln(x)*Pi*b*d*csgn(I*x^n)*c
sgn(I*c*x^n)^2-1/2*I*ln(x)*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I
*ln(x)*Pi*b*d*csgn(I*c*x^n)^3+1/2*I*ln(x)*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+
ln(x)*ln(c)*b*d+ln(x)*a*d
```

maxima [A] time = 0.61, size = 49, normalized size = 0.94

$$-\frac{1}{4}benx^2 + \frac{1}{2}bex^2\log(cx^n) + \frac{1}{2}aex^2 + \frac{bd\log(cx^n)^2}{2n} + ad\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] -1/4*b*e*n*x^2 + 1/2*b*e*x^2*log(c*x^n) + 1/2*a*e*x^2 + 1/2*b*d*log(c*x^n)^
2/n + a*d*log(x)
```

mupad [B] time = 3.34, size = 48, normalized size = 0.92

$$a\,d\,\ln(x)+\frac{e\,x^2\,\left(2\,a-b\,n\right)}{4}+\frac{b\,e\,x^2\,\ln\left(c\,x^n\right)}{2}+\frac{b\,d\,\ln\left(c\,x^n\right)^2}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)*(a + b*log(c*x^n)))/x,x)
```

```
[Out] a*d*log(x) + (e*x^2*(2*a - b*n))/4 + (b*e*x^2*log(c*x^n))/2 + (b*d*log(c*x^
n)^2)/(2*n)
```

sympy [A] time = 0.91, size = 71, normalized size = 1.37

$$ad\log\left(x\right)+\frac{aex^2}{2}+\frac{bdn\log\left(x\right)^2}{2}+bd\log\left(c\right)\log\left(x\right)+\frac{benx^2\log\left(x\right)}{2}-\frac{benx^2}{4}+\frac{bex^2\log\left(c\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] a*d*log(x) + a*e*x**2/2 + b*d*n*log(x)**2/2 + b*d*log(c)*log(x) + b*e*n*x**
2*log(x)/2 - b*e*n*x**2/4 + b*e*x**2*log(c)/2
```

3.175 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=52

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{2x^2}+\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2bn}-\frac{bdn}{4x^2}$$

```
[Out] -1/4*b*d*n/x^2-1/2*d*(a+b*ln(c*x^n))/x^2+1/2*e*(a+b*ln(c*x^n))^2/b/n
```

Rubi [A] time = 0.05, antiderivative size = 47, normalized size of antiderivative = 0.90, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 2301}

$$-\frac{1}{2}\left(\frac{d}{x^2}-2e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{4x^2}-\frac{1}{2}ben\log^2(x)$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d*n)/(4*x^2) - (b*e*n*Log[x]^2)/2 - ((d/x^2 - 2*e*Log[x])*(a + b*Log[c*
x^n]))/2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx &= -\frac{1}{2}\left(\frac{d}{x^2}-2e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(-\frac{d}{2x^3}+\frac{e\log(x)}{x}\right)dx\\ &= -\frac{bdn}{4x^2}-\frac{1}{2}\left(\frac{d}{x^2}-2e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(ben)\int\frac{\log(x)}{x}\,dx\\ &= -\frac{bdn}{4x^2}-\frac{1}{2}ben\log^2(x)-\frac{1}{2}\left(\frac{d}{x^2}-2e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 57, normalized size = 1.10

$$-\frac{ad}{2x^2}+ae\log(x)-\frac{bd\log\left(cx^n\right)}{2x^2}+\frac{be\log^2\left(cx^n\right)}{2n}-\frac{bdn}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -1/2*(a*d)/x^2 - (b*d*n)/(4*x^2) + a*e*Log[x] - (b*d*Log[c*x^n])/(2*x^2) +
(b*e*Log[c*x^n]^2)/(2*n)
```

fricas [A] time = 0.49, size = 59, normalized size = 1.13

$$\frac{2\,benx^2\log(x)^2 - bdn - 2\,bd\log(c) - 2\,ad + 2\left(2\,bex^2\log(c) + 2\,aex^2 - bdn\right)\log(x)}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*e*n*x^2*log(x)^2 - b*d*n - 2*b*d*log(c) - 2*a*d + 2*(2*b*e*x^2*log
(c) + 2*a*e*x^2 - b*d*n)*log(x))/x^2
```

giac [A] time = 0.31, size = 63, normalized size = 1.21

$$\frac{2\,bnx^2e\log(x)^2 + 4\,bx^2e\log(c)\log(x) + 4\,ax^2e\log(x) - 2\,bdn\log(x) - bdn - 2\,bd\log(c) - 2\,ad}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] 1/4*(2*b*n*x^2*e*log(x)^2 + 4*b*x^2*e*log(c)*log(x) + 4*a*x^2*e*log(x) - 2*
b*d*n*log(x) - b*d*n - 2*b*d*log(c) - 2*a*d)/x^2
```

maple [C] time = 0.23, size = 266, normalized size = 5.12

$$-\frac{\left(-2e\,x^2\ln(x) + d\right)b\ln(x^n)}{2x^2} - \frac{2i\pi be\,x^2\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)\ln(x) - 2i\pi be\,x^2\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2\ln$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(b*ln(c*x^n)+a)/x^3,x)
```

```
[Out] -1/2*b*(-2*e*ln(x)*x^2+d)/x^2*ln(x^n)-1/4*(-2*I*ln(x)*Pi*b*e*csgn(I*x^n)*cs
gn(I*c*x^n)^2*x^2+2*I*ln(x)*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2+
2*I*ln(x)*Pi*b*e*csgn(I*c*x^n)^3*x^2-2*I*ln(x)*Pi*b*e*csgn(I*c*x^n)^2*csgn(
I*c)*x^2+I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)-I*Pi*b*d*csgn(I*c*x^n)^3+I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)
+2*b*e*n*ln(x)^2*x^2-4*ln(x)*ln(c)*b*e*x^2-4*ln(x)*a*e*x^2+2*b*d*ln(c)+b*d*
n+2*a*d)/x^2
```

maxima [A] time = 0.55, size = 49, normalized size = 0.94

$$\frac{be\log\left(cx^n\right)^2}{2\,n} + ae\log(x) - \frac{bdn}{4\,x^2} - \frac{bd\log\left(cx^n\right)}{2\,x^2} - \frac{ad}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*b*e*log(c*x^n)^2/n + a*e*log(x) - 1/4*b*d*n/x^2 - 1/2*b*d*log(c*x^n)/x^
2 - 1/2*a*d/x^2
```

mupad [B] time = 3.40, size = 66, normalized size = 1.27

$$\ln(x)\left(a\,e + \frac{b\,e\,n}{2}\right) - \frac{\frac{a\,d}{2} + \frac{b\,d\,n}{4}}{x^2} - \frac{\ln\left(c\,x^n\right)\left(\frac{b\,e\,x^2}{2} + \frac{b\,d}{2}\right)}{x^2} + \frac{b\,e\ln\left(c\,x^n\right)^2}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)*(a + b*log(c*x^n)))/x^3,x)
```

```
[Out] log(x)*(a*e + (b*e*n)/2) - ((a*d)/2 + (b*d*n)/4)/x^2 - (log(c*x^n)*((b*d)/2
 + (b*e*x^2)/2))/x^2 + (b*e*log(c*x^n)^2)/(2*n)
```

sympy [A] time = 4.57, size = 63, normalized size = 1.21

$$-\frac{ad}{2x^2} + ae\log(x) + bd\left(-\frac{n}{4x^2} - \frac{\log(cx^n)}{2x^2}\right) - be\left(\begin{cases} -\log(c)\log(x) & \text{for } n = 0 \\ -\frac{\log(cx^n)^2}{2n} & \text{otherwise} \end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] -a*d/(2*x**2) + a*e*log(x) + b*d*(-n/(4*x**2) - log(c*x**n)/(2*x**2)) - b*e
*Piecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True))
```

3.176 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=57

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{bdn}{16x^4}-\frac{ben}{4x^2}$$

```
[Out] -1/16*b*d*n/x^4-1/4*b*e*n/x^2-1/4*d*(a+b*ln(c*x^n))/x^4-1/2*e*(a+b*ln(c*x^n
))/x^2
```

Rubi [A] time = 0.05, antiderivative size = 47, normalized size of antiderivative = 0.82, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$-\frac{1}{4}\left(\frac{d}{x^4}+\frac{2e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{16x^4}-\frac{ben}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d*n)/(16*x^4) - (b*e*n)/(4*x^2) - ((d/x^4 + (2*e)/x^2)*(a + b*Log[c*x^n
]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)}{x^5}\,dx &= -\frac{1}{4}\left(\frac{d}{x^4}+\frac{2e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-d-2ex^2}{4x^5}\,dx\\
&= -\frac{1}{4}\left(\frac{d}{x^4}+\frac{2e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(bn)\int \frac{-d-2ex^2}{x^5}\,dx\\
&= -\frac{1}{4}\left(\frac{d}{x^4}+\frac{2e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(bn)\int \left(-\frac{d}{x^5}-\frac{2e}{x^3}\right)dx\\
&= -\frac{bdn}{16x^4}-\frac{ben}{4x^2}-\frac{1}{4}\left(\frac{d}{x^4}+\frac{2e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.00, size = 69, normalized size = 1.21

$$-\frac{ad}{4x^4}-\frac{ae}{2x^2}-\frac{bd\log(cx^n)}{4x^4}-\frac{be\log(cx^n)}{2x^2}-\frac{bdn}{16x^4}-\frac{ben}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -1/4*(a*d)/x^4 - (b*d*n)/(16*x^4) - (a*e)/(2*x^2) - (b*e*n)/(4*x^2) - (b*d*
Log[c*x^n])/(4*x^4) - (b*e*Log[c*x^n])/(2*x^2)
```

fricas [A] time = 0.44, size = 60, normalized size = 1.05

$$-\frac{bdn+4\,(ben+2\,ae)x^2+4\,ad+4\left(2\,bex^2+bd\right)\log(c)+4\left(2\,benx^2+bdn\right)\log(x)}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] -1/16*(b*d*n + 4*(b*e*n + 2*a*e)*x^2 + 4*a*d + 4*(2*b*e*x^2 + b*d)*log(c) +
 4*(2*b*e*n*x^2 + b*d*n)*log(x))/x^4
```

giac [A] time = 0.28, size = 65, normalized size = 1.14

$$-\frac{8\,bnx^2e\log(x)+4\,bnx^2e+8\,bx^2e\log(c)+8\,ax^2e+4\,bdn\log(x)+bdn+4\,bd\log(c)+4\,ad}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] -1/16*(8*b*n*x^2*e*log(x) + 4*b*n*x^2*e + 8*b*x^2*e*log(c) + 8*a*x^2*e + 4*
b*d*n*log(x) + b*d*n + 4*b*d*log(c) + 4*a*d)/x^4
```

maple [C] time = 0.16, size = 248, normalized size = 4.35

$$-\frac{\left(2e\,x^2+d\right)b\ln(x^n)}{4x^4}-\frac{-4i\pi be\,x^2\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)+4i\pi be\,x^2\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2+4i\pi be\,x^2\mathrm{csgn}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(b*ln(c*x^n)+a)/x^5,x)
```

```
[Out] -1/4*b*(2*e*x^2+d)/x^4*ln(x^n)-1/16*(4*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^
n)^2-4*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*Pi*b*e*x^2*csgn
(I*c*x^n)^3+4*I*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+8*b*e*x^2*ln(c)+4*b*e*
n*x^2+8*a*e*x^2+2*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*d*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b*d*csgn(I*c*x^n)^3+2*I*Pi*b*d*csgn(I*c*x
^n)^2*csgn(I*c)+4*b*d*ln(c)+b*d*n+4*a*d)/x^4
```

maxima [A] time = 0.47, size = 57, normalized size = 1.00

$$-\frac{ben}{4\,x^2}-\frac{be\log(cx^n)}{2\,x^2}-\frac{ae}{2\,x^2}-\frac{bdn}{16\,x^4}-\frac{bd\log(cx^n)}{4\,x^4}-\frac{ad}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] -1/4*b*e*n/x^2 - 1/2*b*e*log(c*x^n)/x^2 - 1/2*a*e/x^2 - 1/16*b*d*n/x^4 - 1/
4*b*d*log(c*x^n)/x^4 - 1/4*a*d/x^4
```

mupad [B] time = 3.38, size = 51, normalized size = 0.89

$$-\frac{(2\,a\,e+b\,e\,n)\,x^2+a\,d+\frac{b\,d\,n}{4}}{4\,x^4}-\frac{\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^2}{2}+\frac{b\,d}{4}\right)}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)*(a + b*log(c*x^n)))/x^5,x)
```

```
[Out] - (a*d + x^2*(2*a*e + b*e*n) + (b*d*n)/4)/(4*x^4) - (log(c*x^n)*((b*d)/4 +
(b*e*x^2)/2))/x^4
```

sympy [A] time = 2.57, size = 88, normalized size = 1.54

$$-\frac{ad}{4x^4}-\frac{ae}{2x^2}-\frac{bdn\log\left(x\right)}{4x^4}-\frac{bdn}{16x^4}-\frac{bd\log\left(c\right)}{4x^4}-\frac{ben\log\left(x\right)}{2x^2}-\frac{ben}{4x^2}-\frac{be\log\left(c\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] -a*d/(4*x**4) - a*e/(2*x**2) - b*d*n*log(x)/(4*x**4) - b*d*n/(16*x**4) - b*
d*log(c)/(4*x**4) - b*e*n*log(x)/(2*x**2) - b*e*n/(4*x**2) - b*e*log(c)/(2*
x**2)
```

3.177 $\int x^4 \left(d+ex^2\right) \left(a+b\log\left(cx^n\right)\right) \, dx$

Optimal. Leaf size=48

$$\frac{1}{35}\left(7dx^5+5ex^7\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bdnx^5-\frac{1}{49}benx^7$$

```
[Out] -1/25*b*d*n*x^5-1/49*b*e*n*x^7+1/35*(5*e*x^7+7*d*x^5)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.04, antiderivative size = 48, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$\frac{1}{35}\left(7dx^5+5ex^7\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bdnx^5-\frac{1}{49}benx^7$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^5)/25 - (b*e*n*x^7)/49 + ((7*d*x^5 + 5*e*x^7)*(a + b*Log[c*x^n]))
/35
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int x^4\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)dx &= \frac{1}{35}\left(7dx^5+5ex^7\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(\frac{dx^4}{5}+\frac{ex^6}{7}\right)dx\\ &= -\frac{1}{25}bdnx^5-\frac{1}{49}benx^7+\frac{1}{35}\left(7dx^5+5ex^7\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 69, normalized size = 1.44

$$\frac{1}{5}adx^5+\frac{1}{7}aex^7+\frac{1}{5}bdx^5\log\left(cx^n\right)+\frac{1}{7}bex^7\log\left(cx^n\right)-\frac{1}{25}bdnx^5-\frac{1}{49}benx^7$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (a*d*x^5)/5 - (b*d*n*x^5)/25 + (a*e*x^7)/7 - (b*e*n*x^7)/49 + (b*d*x^5*Log[
c*x^n])/5 + (b*e*x^7*Log[c*x^n])/7
```

fricas [A] time = 0.53, size = 69, normalized size = 1.44

$$-\frac{1}{49}(ben-7ae)x^7-\frac{1}{25}(bdn-5ad)x^5+\frac{1}{35}\left(5bex^7+7bdx^5\right)\log(c)+\frac{1}{35}\left(5benx^7+7bdnx^5\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/49*(b*e*n - 7*a*e)*x^7 - 1/25*(b*d*n - 5*a*d)*x^5 + 1/35*(5*b*e*x^7 + 7*
b*d*x^5)*log(c) + 1/35*(5*b*e*n*x^7 + 7*b*d*n*x^5)*log(x)
```

giac [A] time = 0.38, size = 73, normalized size = 1.52

$$\frac{1}{7}bnx^7e\log(x)-\frac{1}{49}bnx^7e+\frac{1}{7}bx^7e\log(c)+\frac{1}{7}ax^7e+\frac{1}{5}bdnx^5\log(x)-\frac{1}{25}bdnx^5+\frac{1}{5}bdx^5\log(c)+\frac{1}{5}adx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/7*b*n*x^7*e*log(x) - 1/49*b*n*x^7*e + 1/7*b*x^7*e*log(c) + 1/7*a*x^7*e +
1/5*b*d*n*x^5*log(x) - 1/25*b*d*n*x^5 + 1/5*b*d*x^5*log(c) + 1/5*a*d*x^5
```

maple [C] time = 0.20, size = 266, normalized size = 5.54

$$-\frac{i\pi be\,x^7\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)}{14}+\frac{i\pi be\,x^7\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ic\,x^n)^2}{14}+\frac{i\pi be\,x^7\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)^2}{14}-\frac{i\pi be}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/35*b*x^5*(5*e*x^2+7*d)*ln(x^n)+1/14*I*Pi*b*e*x^7*csgn(I*x^n)*csgn(I*c*x^n
)^2-1/14*I*Pi*b*e*x^7*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/14*I*Pi*b*e*x^7
*csgn(I*c*x^n)^3+1/14*I*Pi*b*e*x^7*csgn(I*c*x^n)^2*csgn(I*c)+1/7*ln(c)*b*e*
x^7-1/49*b*e*n*x^7+1/7*a*e*x^7+1/10*I*Pi*b*d*x^5*csgn(I*x^n)*csgn(I*c*x^n)^
2-1/10*I*Pi*b*d*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/10*I*Pi*b*d*x^5*c
sgn(I*c*x^n)^3+1/10*I*Pi*b*d*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/5*ln(c)*b*d*x^
5-1/25*b*d*n*x^5+1/5*a*d*x^5
```

maxima [A] time = 0.47, size = 57, normalized size = 1.19

$$-\frac{1}{49}\,benx^7+\frac{1}{7}\,bex^7\log\left(cx^n\right)+\frac{1}{7}\,aex^7-\frac{1}{25}\,bdnx^5+\frac{1}{5}\,bdx^5\log\left(cx^n\right)+\frac{1}{5}\,adx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/49*b*e*n*x^7 + 1/7*b*e*x^7*log(c*x^n) + 1/7*a*e*x^7 - 1/25*b*d*n*x^5 + 1
/5*b*d*x^5*log(c*x^n) + 1/5*a*d*x^5
```

mupad [B] time = 3.35, size = 51, normalized size = 1.06

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^7}{7}+\frac{b\,d\,x^5}{5}\right)+\frac{d\,x^5\,\left(5\,a-b\,n\right)}{25}+\frac{e\,x^7\,\left(7\,a-b\,n\right)}{49}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d + e*x^2)*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d*x^5)/5 + (b*e*x^7)/7) + (d*x^5*(5*a - b*n))/25 + (e*x^7*(7
*a - b*n))/49
```

sympy [B] time = 5.84, size = 87, normalized size = 1.81

$$\frac{adx^5}{5}+\frac{aex^7}{7}+\frac{bdnx^5\log\left(x\right)}{5}-\frac{bdnx^5}{25}+\frac{bdx^5\log\left(c\right)}{5}+\frac{benx^7\log\left(x\right)}{7}-\frac{benx^7}{49}+\frac{bex^7\log\left(c\right)}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**5/5 + a*e*x**7/7 + b*d*n*x**5*log(x)/5 - b*d*n*x**5/25 + b*d*x**5*lo
g(c)/5 + b*e*n*x**7*log(x)/7 - b*e*n*x**7/49 + b*e*x**7*log(c)/7
```

3.178 $\int x^2 \left(d+ex^2\right) \left(a+b\log\left(cx^n\right)\right) \, dx$

Optimal. Leaf size=48

$$\frac{1}{15}\left(5dx^3+3ex^5\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bdnx^3-\frac{1}{25}benx^5$$

```
[Out] -1/9*b*d*n*x^3-1/25*b*e*n*x^5+1/15*(3*e*x^5+5*d*x^3)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.04, antiderivative size = 48, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$\frac{1}{15}\left(5dx^3+3ex^5\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bdnx^3-\frac{1}{25}benx^5$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^3)/9 - (b*e*n*x^5)/25 + ((5*d*x^3 + 3*e*x^5)*(a + b*Log[c*x^n]))/
15
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int x^2\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{15}\left(5dx^3+3ex^5\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(\frac{dx^2}{3}+\frac{ex^4}{5}\right)dx\\ &= -\frac{1}{9}bdnx^3-\frac{1}{25}benx^5+\frac{1}{15}\left(5dx^3+3ex^5\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 69, normalized size = 1.44

$$\frac{1}{3}adx^3+\frac{1}{5}aex^5+\frac{1}{3}bdx^3\log\left(cx^n\right)+\frac{1}{5}bex^5\log\left(cx^n\right)-\frac{1}{9}bdnx^3-\frac{1}{25}benx^5$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (a*d*x^3)/3 - (b*d*n*x^3)/9 + (a*e*x^5)/5 - (b*e*n*x^5)/25 + (b*d*x^3*Log[c
*x^n])/3 + (b*e*x^5*Log[c*x^n])/5
```

fricas [A] time = 0.52, size = 69, normalized size = 1.44

$$-\frac{1}{25}\left(ben-5\,ae\right)x^5-\frac{1}{9}\left(bdn-3\,ad\right)x^3+\frac{1}{15}\left(3\,bex^5+5\,bdx^3\right)\log(c)+\frac{1}{15}\left(3\,benx^5+5\,bdnx^3\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/25*(b*e*n - 5*a*e)*x^5 - 1/9*(b*d*n - 3*a*d)*x^3 + 1/15*(3*b*e*x^5 + 5*b
*d*x^3)*log(c) + 1/15*(3*b*e*n*x^5 + 5*b*d*n*x^3)*log(x)
```

giac [A] time = 0.36, size = 73, normalized size = 1.52

$$\frac{1}{5}bnx^5e\log(x)-\frac{1}{25}bnx^5e+\frac{1}{5}bx^5e\log(c)+\frac{1}{5}ax^5e+\frac{1}{3}bdnx^3\log(x)-\frac{1}{9}bdnx^3+\frac{1}{3}bdx^3\log(c)+\frac{1}{3}adx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/5*b*n*x^5*e*log(x) - 1/25*b*n*x^5*e + 1/5*b*x^5*e*log(c) + 1/5*a*x^5*e +
1/3*b*d*n*x^3*log(x) - 1/9*b*d*n*x^3 + 1/3*b*d*x^3*log(c) + 1/3*a*d*x^3
```

maple [C] time = 0.21, size = 266, normalized size = 5.54

$$-\frac{i\pi be\,x^5\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)}{10}+\frac{i\pi be\,x^5\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ic\,x^n)^2}{10}+\frac{i\pi be\,x^5\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)^2}{10}-\frac{i\pi be\,x^5}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/15*b*x^3*(3*e*x^2+5*d)*ln(x^n)+1/10*I*Pi*b*e*x^5*csgn(I*x^n)*csgn(I*c*x^n
)^2-1/10*I*Pi*b*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/10*I*Pi*b*e*x^5
*csgn(I*c*x^n)^3+1/10*I*Pi*b*e*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/5*b*e*x^5*ln
(c)-1/25*b*e*n*x^5+1/5*a*e*x^5+1/6*I*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2
-1/6*I*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I*Pi*b*d*x^3*csgn
(I*c*x^n)^3+1/6*I*Pi*b*d*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*b*d*x^3*ln(c)-1/
9*b*d*n*x^3+1/3*a*d*x^3
```

maxima [A] time = 0.46, size = 57, normalized size = 1.19

$$-\frac{1}{25}benx^5+\frac{1}{5}bex^5\log\left(cx^n\right)+\frac{1}{5}aex^5-\frac{1}{9}bdnx^3+\frac{1}{3}bdx^3\log\left(cx^n\right)+\frac{1}{3}adx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/25*b*e*n*x^5 + 1/5*b*e*x^5*log(c*x^n) + 1/5*a*e*x^5 - 1/9*b*d*n*x^3 + 1/
3*b*d*x^3*log(c*x^n) + 1/3*a*d*x^3
```

mupad [B] time = 3.31, size = 51, normalized size = 1.06

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^5}{5}+\frac{b\,d\,x^3}{3}\right)+\frac{d\,x^3\,\left(3\,a-b\,n\right)}{9}+\frac{e\,x^5\,\left(5\,a-b\,n\right)}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d + e*x^2)*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d*x^3)/3 + (b*e*x^5)/5) + (d*x^3*(3*a - b*n))/9 + (e*x^5*(5*
a - b*n))/25
```

sympy [B] time = 2.31, size = 87, normalized size = 1.81

$$\frac{adx^3}{3}+\frac{aex^5}{5}+\frac{bdnx^3\log\left(x\right)}{3}-\frac{bdnx^3}{9}+\frac{bdx^3\log\left(c\right)}{3}+\frac{benx^5\log\left(x\right)}{5}-\frac{benx^5}{25}+\frac{bex^5\log\left(c\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**3/3 + a*e*x**5/5 + b*d*n*x**3*log(x)/3 - b*d*n*x**3/9 + b*d*x**3*log
(c)/3 + b*e*n*x**5*log(x)/5 - b*e*n*x**5/25 + b*e*x**5*log(c)/5
```

3.179 $\int \left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=48

$$dx\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}ex^3\left(a+b\log\left(cx^n\right)\right)-bdnx-\frac{1}{9}benx^3$$

```
[Out] -b*d*n*x-1/9*b*e*n*x^3+d*x*(a+b*ln(c*x^n))+1/3*e*x^3*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.02, antiderivative size = 41, normalized size of antiderivative = 0.85, number of steps used = 2, number of rules used = 1, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2313}

$$\frac{1}{3}\left(3dx+ex^3\right)\left(a+b\log\left(cx^n\right)\right)-bdnx-\frac{1}{9}benx^3$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x) - (b*e*n*x^3)/9 + ((3*d*x + e*x^3)*(a + b*Log[c*x^n]))/3
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\begin{aligned}\int \left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)\,dx&=\frac{1}{3}\left(3dx+ex^3\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(d+\frac{ex^2}{3}\right)\,dx\\&=-bdnx-\frac{1}{9}benx^3+\frac{1}{3}\left(3dx+ex^3\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 55, normalized size = 1.15

$$adx+\frac{1}{3}aex^3+bdx\log\left(cx^n\right)+\frac{1}{3}bex^3\log\left(cx^n\right)-bdnx-\frac{1}{9}benx^3$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] a*d*x - b*d*n*x + (a*e*x^3)/3 - (b*e*n*x^3)/9 + b*d*x*Log[c*x^n] + (b*e*x^3
*Log[c*x^n])/3
```

fricas [A] time = 0.53, size = 61, normalized size = 1.27

$$-\frac{1}{9}\left(ben-3\,ae\right)x^3-\left(bdn-ad\right)x+\frac{1}{3}\left(bex^3+3\,bdx\right)\log(c)+\frac{1}{3}\left(benx^3+3\,bdnx\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/9*(b*e*n - 3*a*e)*x^3 - (b*d*n - a*d)*x + 1/3*(b*e*x^3 + 3*b*d*x)*log(c)
 + 1/3*(b*e*n*x^3 + 3*b*d*n*x)*log(x)
```

giac [A] time = 0.24, size = 62, normalized size = 1.29

$$\frac{1}{3}\,bnx^3e\log(x) - \frac{1}{9}\,bnx^3e + \frac{1}{3}\,bx^3e\log(c) + \frac{1}{3}\,ax^3e + bdnx\log(x) - bdnx + bdx\log(c) + adx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/3*b*n*x^3*e*log(x) - 1/9*b*n*x^3*e + 1/3*b*x^3*e*log(c) + 1/3*a*x^3*e + b
*d*n*x*log(x) - b*d*n*x + b*d*x*log(c) + a*d*x
```

maple [C] time = 0.21, size = 247, normalized size = 5.15

$$-\frac{i\pi be\,x^3\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)}{6}+\frac{i\pi be\,x^3\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ic\,x^n)^2}{6}+\frac{i\pi be\,x^3\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)^2}{6}-\frac{i\pi be}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/3*b*x*(e*x^2+3*d)*ln(x^n)+1/6*I*Pi*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1/
6*I*Pi*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I*Pi*b*e*x^3*csgn(I*
c*x^n)^3+1/6*I*Pi*b*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*Pi*b*d*csgn(I*x^n
)*csgn(I*c*x^n)^2*x-1/2*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-1/2*
I*Pi*b*d*csgn(I*c*x^n)^3*x+1/2*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*x+1/3*b*e
*x^3*ln(c)-1/9*b*e*n*x^3+1/3*a*e*x^3+b*d*x*ln(c)-b*d*n*x+a*d*x
```

maxima [A] time = 0.48, size = 49, normalized size = 1.02

$$-\frac{1}{9}\,benx^3 + \frac{1}{3}\,bex^3\log\left(cx^n\right) + \frac{1}{3}\,aex^3 - bdnx + bdx\log\left(cx^n\right) + adx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/9*b*e*n*x^3 + 1/3*b*e*x^3*log(c*x^n) + 1/3*a*e*x^3 - b*d*n*x + b*d*x*log
(c*x^n) + a*d*x
```

mupad [B] time = 3.31, size = 43, normalized size = 0.90

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^3}{3}+b\,d\,x\right)+d\,x\,\left(a-b\,n\right)+\frac{e\,x^3\,\left(3\,a-b\,n\right)}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*(b*d*x + (b*e*x^3)/3) + d*x*(a - b*n) + (e*x^3*(3*a - b*n))/9
```

sympy [A] time = 0.86, size = 73, normalized size = 1.52

$$adx + \frac{aex^3}{3} + bdnx\log\left(x\right) - bdnx + bdx\log\left(c\right) + \frac{benx^3\log\left(x\right)}{3} - \frac{benx^3}{9} + \frac{bex^3\log\left(c\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x + a*e*x**3/3 + b*d*n*x*log(x) - b*d*n*x + b*d*x*log(c) + b*e*n*x**3*l
og(x)/3 - b*e*n*x**3/9 + b*e*x**3*log(c)/3
```

3.180 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^2} dx$

Optimal. Leaf size=44

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{x}+ex\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{x}-benx$$

```
[Out] -b*d*n/x-b*e*n*x-d*(a+b*ln(c*x^n))/x+e*x*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.04, antiderivative size = 37, normalized size of antiderivative = 0.84, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$-\left(\frac{d}{x}-ex\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{x}-benx$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d*n)/x) - b*e*n*x - (d/x - e*x)*(a + b*Log[c*x^n])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx &= -\left(\frac{d}{x}-ex\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(e-\frac{d}{x^2}\right)dx\\ &= -\frac{bdn}{x}-benx-\left(\frac{d}{x}-ex\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 49, normalized size = 1.11

$$-\frac{ad}{x}+aex-\frac{bd\log\left(cx^n\right)}{x}+bex\log\left(cx^n\right)-\frac{bdn}{x}-benx$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((a*d)/x) - (b*d*n)/x + a*e*x - b*e*n*x - (b*d*Log[c*x^n])/x + b*e*x*Log[c
*x^n]
```

fricas [A] time = 0.43, size = 58, normalized size = 1.32

$$-\frac{bdn+(ben-ae)x^2+ad-\left(bex^2-bd\right)\log(c)-\left(benx^2-bdn\right)\log(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -(b*d*n + (b*e*n - a*e)*x^2 + a*d - (b*e*x^2 - b*d)*log(c) - (b*e*n*x^2 - b
*d*n)*log(x))/x
```

giac [A] time = 0.35, size = 62, normalized size = 1.41

$$\frac{bnx^2e\log(x) - bnx^2e + bx^2e\log(c) + ax^2e - bdn\log(x) - bdn - bd\log(c) - ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] (b*n*x^2*e*log(x) - b*n*x^2*e + b*x^2*e*log(c) + a*x^2*e - b*d*n*log(x) - b
*d*n - b*d*log(c) - a*d)/x
```

maple [C] time = 0.22, size = 249, normalized size = 5.66

$$-\frac{\left(-e\,x^2+d\right)b\ln\left(x^n\right)}{x}-\frac{i\pi be\,x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)-i\pi be\,x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2-i\pi be\,x^2\mathrm{csgn}\left(i\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(b*ln(c*x^n)+a)/x^2,x)
```

```
[Out] -b*(-e*x^2+d)/x*ln(x^n)-1/2*(-I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi
*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e*x^2*csgn(I*c*x^n)^3-I
*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-
I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d*csgn(I*c*x^n)^3+I*Pi*
b*d*csgn(I*c*x^n)^2*csgn(I*c)-2*b*e*x^2*ln(c)+2*b*e*n*x^2-2*a*e*x^2+2*b*d*l
n(c)+2*b*d*n+2*a*d)/x
```

maxima [A] time = 0.47, size = 49, normalized size = 1.11

$$-benx + bex\log\left(cx^n\right) + aex - \frac{bdn}{x} - \frac{bd\log\left(cx^n\right)}{x} - \frac{ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] -b*e*n*x + b*e*x*log(c*x^n) + a*e*x - b*d*n/x - b*d*log(c*x^n)/x - a*d/x
```

mupad [B] time = 3.34, size = 51, normalized size = 1.16

$$e\,x\,\left(a-b\,n\right)-\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^2+b\,d}{x}-2\,b\,e\,x\right)-\frac{a\,d+b\,d\,n}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)*(a + b*log(c*x^n)))/x^2,x)
```

```
[Out] e*x*(a - b*n) - log(c*x^n)*((b*d + b*e*x^2)/x - 2*b*e*x) - (a*d + b*d*n)/x
```

sympy [A] time = 0.89, size = 60, normalized size = 1.36

$$-\frac{ad}{x} + aex - \frac{bdn\log\left(x\right)}{x} - \frac{bdn}{x} - \frac{bd\log\left(c\right)}{x} + benx\log\left(x\right) - benx + bex\log\left(c\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] -a*d/x + a*e*x - b*d*n*log(x)/x - b*d*n/x - b*d*log(c)/x + b*e*n*x*log(x) -
 b*e*n*x + b*e*x*log(c)
```

3.181 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^4} dx$

Optimal. Leaf size=53

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{bdn}{9x^3}-\frac{ben}{x}$$

```
[Out] -1/9*b*d*n/x^3-b*e*n/x-1/3*d*(a+b*ln(c*x^n))/x^3-e*(a+b*ln(c*x^n))/x
```

Rubi [A] time = 0.05, antiderivative size = 45, normalized size of antiderivative = 0.85, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$-\frac{1}{3}\left(\frac{d}{x^3}+\frac{3e}{x}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{9x^3}-\frac{ben}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d*n)/(9*x^3) - (b*e*n)/x - ((d/x^3 + (3*e)/x)*(a + b*Log[c*x^n]))/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)}{x^4}\,dx &= -\frac{1}{3}\left(\frac{d}{x^3}+\frac{3e}{x}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-d-3ex^2}{3x^4}\,dx\\
&= -\frac{1}{3}\left(\frac{d}{x^3}+\frac{3e}{x}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}(bn)\int \frac{-d-3ex^2}{x^4}\,dx\\
&= -\frac{1}{3}\left(\frac{d}{x^3}+\frac{3e}{x}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}(bn)\int \left(-\frac{d}{x^4}-\frac{3e}{x^2}\right)dx\\
&= -\frac{bdn}{9x^3}-\frac{ben}{x}-\frac{1}{3}\left(\frac{d}{x^3}+\frac{3e}{x}\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.00, size = 63, normalized size = 1.19

$$-\frac{ad}{3x^3}-\frac{ae}{x}-\frac{bd\log\left(cx^n\right)}{3x^3}-\frac{be\log\left(cx^n\right)}{x}-\frac{bdn}{9x^3}-\frac{ben}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -1/3*(a*d)/x^3 - (b*d*n)/(9*x^3) - (a*e)/x - (b*e*n)/x - (b*d*Log[c*x^n])/(
3*x^3) - (b*e*Log[c*x^n])/x
```

fricas [A] time = 0.47, size = 59, normalized size = 1.11

$$-\frac{bdn + 9\,(ben + ae)x^2 + 3\,ad + 3\left(3\,bex^2 + bd\right)\log(c) + 3\left(3\,benx^2 + bdn\right)\log(x)}{9\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(b*d*n + 9*(b*e*n + a*e)*x^2 + 3*a*d + 3*(3*b*e*x^2 + b*d)*log(c) + 3*
(3*b*e*n*x^2 + b*d*n)*log(x))/x^3
```

giac [A] time = 0.27, size = 65, normalized size = 1.23

$$-\frac{9\,bnx^2e\log(x) + 9\,bnx^2e + 9\,bx^2e\log(c) + 9\,ax^2e + 3\,bdn\log(x) + bdn + 3\,bd\log(c) + 3\,ad}{9\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] -1/9*(9*b*n*x^2*e*log(x) + 9*b*n*x^2*e + 9*b*x^2*e*log(c) + 9*a*x^2*e + 3*b
*d*n*log(x) + b*d*n + 3*b*d*log(c) + 3*a*d)/x^3
```

maple [C] time = 0.15, size = 249, normalized size = 4.70

$$-\frac{\left(3e\,x^2 + d\right)b\ln\left(x^n\right)}{3x^3} - \frac{-9i\pi be\,x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right) + 9i\pi be\,x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2 + 9i\pi be\,x^2\mathrm{c}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(b*ln(c*x^n)+a)/x^4,x)
```

```
[Out] -1/3*b*(3*e*x^2+d)/x^3*ln(x^n)-1/18*(9*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^
n)^2-9*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi*b*e*x^2*csgn
(I*c*x^n)^3+9*I*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+18*b*e*x^2*ln(c)+18*b*
e*n*x^2+18*a*e*x^2+3*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*d*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b*d*csgn(I*c*x^n)^3+3*I*Pi*b*d*csgn(I*
c*x^n)^2*csgn(I*c)+6*b*d*ln(c)+2*b*d*n+6*a*d)/x^3
```

maxima [A] time = 0.47, size = 57, normalized size = 1.08

$$-\frac{ben}{x} - \frac{be\log\left(cx^n\right)}{x} - \frac{ae}{x} - \frac{bdn}{9\,x^3} - \frac{bd\log\left(cx^n\right)}{3\,x^3} - \frac{ad}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] -b*e*n/x - b*e*log(c*x^n)/x - a*e/x - 1/9*b*d*n/x^3 - 1/3*b*d*log(c*x^n)/x^
3 - 1/3*a*d/x^3
```

mupad [B] time = 3.63, size = 51, normalized size = 0.96

$$-\frac{(3\,a\,e + 3\,b\,e\,n)\,x^2 + a\,d + \frac{b\,d\,n}{3}}{3\,x^3} - \frac{\ln\left(c\,x^n\right)\left(b\,e\,x^2 + \frac{b\,d}{3}\right)}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)*(a + b*log(c*x^n)))/x^4,x)
```

```
[Out] - (a*d + x^2*(3*a*e + 3*b*e*n) + (b*d*n)/3)/(3*x^3) - (log(c*x^n)*((b*d)/3
+ b*e*x^2))/x^3
```

sympy [A] time = 1.64, size = 75, normalized size = 1.42

$$-\frac{ad}{3x^3}-\frac{ae}{x}-\frac{bdn\log(x)}{3x^3}-\frac{bdn}{9x^3}-\frac{bd\log(c)}{3x^3}-\frac{ben\log(x)}{x}-\frac{ben}{x}-\frac{be\log(c)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d/(3*x**3) - a*e/x - b*d*n*log(x)/(3*x**3) - b*d*n/(9*x**3) - b*d*log(c)
/(3*x**3) - b*e*n*log(x)/x - b*e*n/x - b*e*log(c)/x
```

3.182 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=57

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{bdn}{25x^5}-\frac{ben}{9x^3}$$

```
[Out] -1/25*b*d*n/x^5-1/9*b*e*n/x^3-1/5*d*(a+b*ln(c*x^n))/x^5-1/3*e*(a+b*ln(c*x^n
))/x^3
```

Rubi [A] time = 0.05, antiderivative size = 48, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$-\frac{1}{15}\left(\frac{3d}{x^5}+\frac{5e}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{25x^5}-\frac{ben}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d*n)/(25*x^5) - (b*e*n)/(9*x^3) - (((3*d)/x^5 + (5*e)/x^3)*(a + b*Log[c
*x^n]))/15
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)}{x^6}\,dx &= -\frac{1}{15}\left(\frac{3d}{x^5}+\frac{5e}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-3d-5ex^2}{15x^6}\,dx\\
&= -\frac{1}{15}\left(\frac{3d}{x^5}+\frac{5e}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{15}(bn)\int \frac{-3d-5ex^2}{x^6}\,dx\\
&= -\frac{1}{15}\left(\frac{3d}{x^5}+\frac{5e}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{15}(bn)\int \left(-\frac{3d}{x^6}-\frac{5e}{x^4}\right)dx\\
&= -\frac{bdn}{25x^5}-\frac{ben}{9x^3}-\frac{1}{15}\left(\frac{3d}{x^5}+\frac{5e}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.00, size = 69, normalized size = 1.21

$$-\frac{ad}{5x^5}-\frac{ae}{3x^3}-\frac{bd\log\left(cx^n\right)}{5x^5}-\frac{be\log\left(cx^n\right)}{3x^3}-\frac{bdn}{25x^5}-\frac{ben}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -1/5*(a*d)/x^5 - (b*d*n)/(25*x^5) - (a*e)/(3*x^3) - (b*e*n)/(9*x^3) - (b*d*
Log[c*x^n])/(5*x^5) - (b*e*Log[c*x^n])/(3*x^3)
```

fricas [A] time = 0.45, size = 63, normalized size = 1.11

$$-\frac{9\,bdn+25\,(ben+3\,ae)x^2+45\,ad+15\left(5\,bex^2+3\,bd\right)\log(c)+15\left(5\,benx^2+3\,bdn\right)\log(x)}{225\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/225*(9*b*d*n + 25*(b*e*n + 3*a*e)*x^2 + 45*a*d + 15*(5*b*e*x^2 + 3*b*d)*
log(c) + 15*(5*b*e*n*x^2 + 3*b*d*n)*log(x))/x^5
```

giac [A] time = 0.28, size = 66, normalized size = 1.16

$$-\frac{75\,bnx^2e\log(x)+25\,bnx^2e+75\,bx^2e\log(c)+75\,ax^2e+45\,bdn\log(x)+9\,bdn+45\,bd\log(c)+45\,ad}{225\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] -1/225*(75*b*n*x^2*e*log(x) + 25*b*n*x^2*e + 75*b*x^2*e*log(c) + 75*a*x^2*e
 + 45*b*d*n*log(x) + 9*b*d*n + 45*b*d*log(c) + 45*a*d)/x^5
```

maple [C] time = 0.16, size = 251, normalized size = 4.40

$$-\frac{\left(5e\,x^2+3d\right)b\ln\left(x^n\right)}{15x^5}-\frac{-75i\pi be\,x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)+75i\pi be\,x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2+75i\pi be\,x^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(b*ln(c*x^n)+a)/x^6,x)
```

```
[Out] -1/15*b*(5*e*x^2+3*d)/x^5*ln(x^n)-1/450*(75*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I
*c*x^n)^2-75*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-75*I*Pi*b*e*x
^2*csgn(I*c*x^n)^3+75*I*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+150*b*e*x^2*ln
(c)+50*b*e*n*x^2+150*a*e*x^2+45*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-45*I*P
i*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-45*I*Pi*b*d*csgn(I*c*x^n)^3+45*I*
Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+90*b*d*ln(c)+18*b*d*n+90*a*d)/x^5
```

maxima [A] time = 0.48, size = 57, normalized size = 1.00

$$-\frac{ben}{9\,x^3}-\frac{be\log\left(cx^n\right)}{3\,x^3}-\frac{ae}{3\,x^3}-\frac{bdn}{25\,x^5}-\frac{bd\log\left(cx^n\right)}{5\,x^5}-\frac{ad}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] -1/9*b*e*n/x^3 - 1/3*b*e*log(c*x^n)/x^3 - 1/3*a*e/x^3 - 1/25*b*d*n/x^5 - 1/
5*b*d*log(c*x^n)/x^5 - 1/5*a*d/x^5
```

mupad [B] time = 3.61, size = 53, normalized size = 0.93

$$-\frac{\left(5\,a\,e+\frac{5\,b\,e\,n}{3}\right)\,x^2+3\,a\,d+\frac{3\,b\,d\,n}{5}}{15\,x^5}-\frac{\ln\left(c\,x^n\right)\,\left(\frac{b\,e\,x^2}{3}+\frac{b\,d}{5}\right)}{x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)*(a + b*log(c*x^n)))/x^6,x)
```

```
[Out] - (3*a*d + x^2*(5*a*e + (5*b*e*n)/3) + (3*b*d*n)/5)/(15*x^5) - (log(c*x^n)*
((b*d)/5 + (b*e*x^2)/3))/x^5
```

sympy [A] time = 3.91, size = 88, normalized size = 1.54

$$-\frac{ad}{5x^5}-\frac{ae}{3x^3}-\frac{bdn\log\left(x\right)}{5x^5}-\frac{bdn}{25x^5}-\frac{bd\log\left(c\right)}{5x^5}-\frac{ben\log\left(x\right)}{3x^3}-\frac{ben}{9x^3}-\frac{be\log\left(c\right)}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] -a*d/(5*x**5) - a*e/(3*x**3) - b*d*n*log(x)/(5*x**5) - b*d*n/(25*x**5) - b*
d*log(c)/(5*x**5) - b*e*n*log(x)/(3*x**3) - b*e*n/(9*x**3) - b*e*log(c)/(3*
x**3)
```

3.183 $\int x^5 \left(d+ex^2\right)^2 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=74

$$\frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{10}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{36}bd^2nx^6-\frac{1}{32}bdenx^8-\frac{1}{100}be^2nx^{10}$$

```
[Out] -1/36*b*d^2*n*x^6-1/32*b*d*e*n*x^8-1/100*b*e^2*n*x^10+1/60*(6*e^2*x^10+15*d
*e*x^8+10*d^2*x^6)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.09, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {266, 43, 2334, 12, 14}

$$\frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{10}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{36}bd^2nx^6-\frac{1}{32}bdenx^8-\frac{1}{100}be^2nx^{10}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^6)/36 - (b*d*e*n*x^8)/32 - (b*e^2*n*x^10)/100 + ((10*d^2*x^6 +
15*d*e*x^8 + 6*e^2*x^10)*(a + b*Log[c*x^n]))/60
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^5 \left(d+ex^2\right)^2 \left(a+b\log\left(cx^n\right)\right) dx = \frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{10}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{1}{60}x^5\left(10d^2 \right.$$
$$= \frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{10}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int x^5\left(10d^2 \right.$$
$$= \frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{10}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int \left(10d^2x^5 \right.$$
$$= -\frac{1}{36}bd^2nx^6-\frac{1}{32}bdenx^8-\frac{1}{100}be^2nx^{10}+\frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{1\cdots}\right.$$

Mathematica [A] time = 0.04, size = 84, normalized size = 1.14

$$\frac{x^6\left(1200d^2\left(a+b\log\left(cx^n\right)\right)+1800dex^2\left(a+b\log\left(cx^n\right)\right)+720e^2x^4\left(a+b\log\left(cx^n\right)\right)-200bd^2n-225bdenx^2\right.}{7200}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^6*(-200*b*d^2*n - 225*b*d*e*n*x^2 - 72*b*e^2*n*x^4 + 1200*d^2*(a + b*Log
[c*x^n]) + 1800*d*e*x^2*(a + b*Log[c*x^n]) + 720*e^2*x^4*(a + b*Log[c*x^n])
))/7200
```

fricas [A] time = 0.58, size = 118, normalized size = 1.59

$$-\frac{1}{100}\left(be^2n-10\,ae^2\right)x^{10}-\frac{1}{32}\left(bden-8\,ade\right)x^8-\frac{1}{36}\left(bd^2n-6\,ad^2\right)x^6+\frac{1}{60}\left(6\,be^2x^{10}+15\,bdex^8+10\,bd^2x^6\right)\log(\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/100*(b*e^2*n - 10*a*e^2)*x^10 - 1/32*(b*d*e*n - 8*a*d*e)*x^8 - 1/36*(b*d
^2*n - 6*a*d^2)*x^6 + 1/60*(6*b*e^2*x^10 + 15*b*d*e*x^8 + 10*b*d^2*x^6)*log
(c) + 1/60*(6*b*e^2*n*x^10 + 15*b*d*e*n*x^8 + 10*b*d^2*n*x^6)*log(x)
```

giac [A] time = 0.24, size = 123, normalized size = 1.66

$$\frac{1}{10}\,bnx^{10}e^2\log(x)-\frac{1}{100}\,bnx^{10}e^2+\frac{1}{10}\,bx^{10}e^2\log(c)+\frac{1}{4}\,bdnx^8e\log(x)+\frac{1}{10}\,ax^{10}e^2-\frac{1}{32}\,bdnx^8e+\frac{1}{4}\,bdx^8e\log(c)+\frac{1}{4}\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/10*b*n*x^10*e^2*log(x) - 1/100*b*n*x^10*e^2 + 1/10*b*x^10*e^2*log(c) + 1/
4*b*d*n*x^8*e*log(x) + 1/10*a*x^10*e^2 - 1/32*b*d*n*x^8*e + 1/4*b*d*x^8*e*l
og(c) + 1/4*a*d*x^8*e + 1/6*b*d^2*n*x^6*log(x) - 1/36*b*d^2*n*x^6 + 1/6*b*d
^2*x^6*log(c) + 1/6*a*d^2*x^6
```

maple [C] time = 0.21, size = 434, normalized size = 5.86

$$-\frac{i\pi b\,e^2x^{10}\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{20}+\frac{i\pi b\,e^2x^{10}\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{20}+\frac{i\pi b\,e^2x^{10}\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{20}\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(e*x^2+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/60*b*x^6*(6*e^2*x^4+15*d*e*x^2+10*d^2)*ln(x^n)-1/20*I*Pi*b*e^2*x^10*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/8*I*Pi*b*d*e*x^8*csgn(I*c*x^n)^2*csgn(I*c)
```

```
+1/12*I*Pi*b*d^2*x^6*csgn(I*c*x^n)^2*csgn(I*c)-1/12*I*Pi*b*d^2*x^6*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)+1/10*ln(c)*b*e^2*x^10-1/100*b*e^2*n*x^10+1/10*a
*e^2*x^10+1/12*I*Pi*b*d^2*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2-1/8*I*Pi*b*d*e*x^
8*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/20*I*Pi*b*e^2*x^10*csgn(I*c*x^n)^3-
1/8*I*Pi*b*d*e*x^8*csgn(I*c*x^n)^3+1/4*ln(c)*b*d*e*x^8-1/32*b*d*e*n*x^8+1/4
*a*d*e*x^8-1/12*I*Pi*b*d^2*x^6*csgn(I*c*x^n)^3+1/20*I*Pi*b*e^2*x^10*csgn(I*
x^n)*csgn(I*c*x^n)^2+1/8*I*Pi*b*d*e*x^8*csgn(I*x^n)*csgn(I*c*x^n)^2+1/20*I*
Pi*b*e^2*x^10*csgn(I*c*x^n)^2*csgn(I*c)+1/6*ln(c)*b*d^2*x^6-1/36*b*d^2*n*x^
6+1/6*a*d^2*x^6
```

maxima [A] time = 0.48, size = 100, normalized size = 1.35

$$-\frac{1}{100}\,be^2nx^{10}+\frac{1}{10}\,be^2x^{10}\log\left(cx^n\right)+\frac{1}{10}\,ae^2x^{10}-\frac{1}{32}\,bdenx^8+\frac{1}{4}\,bdex^8\log\left(cx^n\right)+\frac{1}{4}\,adex^8-\frac{1}{36}\,bd^2nx^6+\frac{1}{6}\,bd^2x^6\log\left(c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/100*b*e^2*n*x^10 + 1/10*b*e^2*x^10*log(c*x^n) + 1/10*a*e^2*x^10 - 1/32*b
*d*e*n*x^8 + 1/4*b*d*e*x^8*log(c*x^n) + 1/4*a*d*e*x^8 - 1/36*b*d^2*n*x^6 +
1/6*b*d^2*x^6*log(c*x^n) + 1/6*a*d^2*x^6
```

mupad [B] time = 3.70, size = 82, normalized size = 1.11

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^2\,x^6}{6}+\frac{b\,d\,e\,x^8}{4}+\frac{b\,e^2\,x^{10}}{10}\right)+\frac{d^2\,x^6\,\left(6\,a-b\,n\right)}{36}+\frac{e^2\,x^{10}\,\left(10\,a-b\,n\right)}{100}+\frac{d\,e\,x^8\,\left(8\,a-b\,n\right)}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d + e*x^2)^2*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d^2*x^6)/6 + (b*e^2*x^10)/10 + (b*d*e*x^8)/4) + (d^2*x^6*(6*
a - b*n))/36 + (e^2*x^10*(10*a - b*n))/100 + (d*e*x^8*(8*a - b*n))/32
```

sympy [B] time = 21.66, size = 151, normalized size = 2.04

$$\frac{ad^2x^6}{6}+\frac{adex^8}{4}+\frac{ae^2x^{10}}{10}+\frac{bd^2nx^6\log\left(x\right)}{6}-\frac{bd^2nx^6}{36}+\frac{bd^2x^6\log\left(c\right)}{6}+\frac{bdenx^8\log\left(x\right)}{4}-\frac{bdenx^8}{32}+\frac{bdex^8\log\left(c\right)}{4}+\frac{be^2nx^{10}}{1(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**6/6 + a*d*e*x**8/4 + a*e**2*x**10/10 + b*d**2*n*x**6*log(x)/6 - b
*d**2*n*x**6/36 + b*d**2*x**6*log(c)/6 + b*d*e*n*x**8*log(x)/4 - b*d*e*n*x*
*8/32 + b*d*e*x**8*log(c)/4 + b*e**2*n*x**10*log(x)/10 - b*e**2*n*x**10/100
 + b*e**2*x**10*log(c)/10
```

3.184 $\int x^3 \left(d+ex^2\right)^2 \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=74

$$\frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bd^2nx^4-\frac{1}{18}bdenx^6-\frac{1}{64}be^2nx^8$$

```
[Out] -1/16*b*d^2*n*x^4-1/18*b*d*e*n*x^6-1/64*b*e^2*n*x^8+1/24*(3*e^2*x^8+8*d*e*x
^6+6*d^2*x^4)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.09, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {266, 43, 2334, 12, 14}

$$\frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bd^2nx^4-\frac{1}{18}bdenx^6-\frac{1}{64}be^2nx^8$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^4)/16 - (b*d*e*n*x^6)/18 - (b*e^2*n*x^8)/64 + ((6*d^2*x^4 + 8*d
*e*x^6 + 3*e^2*x^8)*(a + b*Log[c*x^n]))/24
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^3 \left(d+ex^2\right)^2 \left(a+b\log\left(cx^n\right)\right) dx = \frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{1}{24}x^3\left(6d^2+8dex^2\right.$$
$$= \frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{24}(bn)\int x^3\left(6d^2+8dex^2\right.$$
$$= \frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{24}(bn)\int\left(6d^2x^3+8dex^5\right.$$
$$= -\frac{1}{16}bd^2nx^4-\frac{1}{18}bdenx^6-\frac{1}{64}be^2nx^8+\frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)\left(a+b\right.$$

Mathematica [A] time = 0.06, size = 87, normalized size = 1.18

$$\frac{1}{576}x^4\left(24a\left(6d^2+8dex^2+3e^2x^4\right)+24b\left(6d^2+8dex^2+3e^2x^4\right)\log\left(cx^n\right)-bn\left(36d^2+32dex^2+9e^2x^4\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(24*a*(6*d^2 + 8*d*e*x^2 + 3*e^2*x^4) - b*n*(36*d^2 + 32*d*e*x^2 + 9*e
^2*x^4) + 24*b*(6*d^2 + 8*d*e*x^2 + 3*e^2*x^4)*Log[c*x^n]))/576
```

fricas [A] time = 0.46, size = 118, normalized size = 1.59

$$-\frac{1}{64}\left(be^2n-8\,ae^2\right)x^8-\frac{1}{18}\left(bden-6\,ade\right)x^6-\frac{1}{16}\left(bd^2n-4\,ad^2\right)x^4+\frac{1}{24}\left(3\,be^2x^8+8\,bdex^6+6\,bd^2x^4\right)\log(c)+\frac{1}{24}\left(3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/64*(b*e^2*n - 8*a*e^2)*x^8 - 1/18*(b*d*e*n - 6*a*d*e)*x^6 - 1/16*(b*d^2*
n - 4*a*d^2)*x^4 + 1/24*(3*b*e^2*x^8 + 8*b*d*e*x^6 + 6*b*d^2*x^4)*log(c) +
1/24*(3*b*e^2*n*x^8 + 8*b*d*e*n*x^6 + 6*b*d^2*n*x^4)*log(x)
```

giac [A] time = 0.33, size = 123, normalized size = 1.66

$$\frac{1}{8}\,bnx^8e^2\log(x)-\frac{1}{64}\,bnx^8e^2+\frac{1}{8}\,bx^8e^2\log(c)+\frac{1}{3}\,bdnx^6e\log(x)+\frac{1}{8}\,ax^8e^2-\frac{1}{18}\,bdnx^6e+\frac{1}{3}\,bdx^6e\log(c)+\frac{1}{3}\,adx^6e+\frac{1}{4}\,b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/8*b*n*x^8*e^2*log(x) - 1/64*b*n*x^8*e^2 + 1/8*b*x^8*e^2*log(c) + 1/3*b*d*
n*x^6*e*log(x) + 1/8*a*x^8*e^2 - 1/18*b*d*n*x^6*e + 1/3*b*d*x^6*e*log(c) +
1/3*a*d*x^6*e + 1/4*b*d^2*n*x^4*log(x) - 1/16*b*d^2*n*x^4 + 1/4*b*d^2*x^4*l
og(c) + 1/4*a*d^2*x^4
```

maple [C] time = 0.21, size = 434, normalized size = 5.86

$$-\frac{i\pi b\,e^2x^8\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{16}+\frac{i\pi b\,e^2x^8\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{16}+\frac{i\pi b\,e^2x^8\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{16}-\frac{i\pi b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/24*b*x^4*(3*e^2*x^4+8*d*e*x^2+6*d^2)*ln(x^n)+1/6*I*Pi*b*d*e*x^6*csgn(I*c*
x^n)^2*csgn(I*c)-1/6*I*Pi*b*d*e*x^6*csgn(I*c*x^n)^3+1/16*I*Pi*b*e^2*x^8*csg
n(I*x^n)*csgn(I*c*x^n)^2+1/8*I*Pi*b*d^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/8*l
```

```
n(c)*b*e^2*x^8-1/64*b*e^2*n*x^8+1/8*a*e^2*x^8-1/8*I*Pi*b*d^2*x^4*csgn(I*c*x
^n)^3-1/16*I*Pi*b*e^2*x^8*csgn(I*c*x^n)^3-1/6*I*Pi*b*d*e*x^6*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)+1/6*I*Pi*b*d*e*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*ln
(c)*b*d*e*x^6-1/18*b*d*e*n*x^6+1/3*a*d*e*x^6-1/16*I*Pi*b*e^2*x^8*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)-1/8*I*Pi*b*d^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)+1/8*I*Pi*b*d^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+1/16*I*Pi*b*e^2*x^8*cs
gn(I*c*x^n)^2*csgn(I*c)+1/4*b*d^2*x^4*ln(c)-1/16*b*d^2*n*x^4+1/4*a*d^2*x^4
```

maxima [A] time = 0.53, size = 100, normalized size = 1.35

$$-\frac{1}{64}be^2nx^8+\frac{1}{8}be^2x^8\log(cx^n)+\frac{1}{8}ae^2x^8-\frac{1}{18}bdenx^6+\frac{1}{3}bdex^6\log(cx^n)+\frac{1}{3}adex^6-\frac{1}{16}bd^2nx^4+\frac{1}{4}bd^2x^4\log(cx^n)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/64*b*e^2*n*x^8 + 1/8*b*e^2*x^8*log(c*x^n) + 1/8*a*e^2*x^8 - 1/18*b*d*e*n
*x^6 + 1/3*b*d*e*x^6*log(c*x^n) + 1/3*a*d*e*x^6 - 1/16*b*d^2*n*x^4 + 1/4*b*
d^2*x^4*log(c*x^n) + 1/4*a*d^2*x^4
```

mupad [B] time = 3.65, size = 82, normalized size = 1.11

$$\ln(c\,x^n)\left(\frac{b\,d^2\,x^4}{4}+\frac{b\,d\,e\,x^6}{3}+\frac{b\,e^2\,x^8}{8}\right)+\frac{d^2\,x^4\,\left(4\,a-b\,n\right)}{16}+\frac{e^2\,x^8\,\left(8\,a-b\,n\right)}{64}+\frac{d\,e\,x^6\,\left(6\,a-b\,n\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d + e*x^2)^2*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d^2*x^4)/4 + (b*e^2*x^8)/8 + (b*d*e*x^6)/3) + (d^2*x^4*(4*a
- b*n))/16 + (e^2*x^8*(8*a - b*n))/64 + (d*e*x^6*(6*a - b*n))/18
```

sympy [B] time = 9.64, size = 151, normalized size = 2.04

$$\frac{ad^2x^4}{4}+\frac{adex^6}{3}+\frac{ae^2x^8}{8}+\frac{bd^2nx^4\log(x)}{4}-\frac{bd^2nx^4}{16}+\frac{bd^2x^4\log(c)}{4}+\frac{bdenx^6\log(x)}{3}-\frac{bdenx^6}{18}+\frac{bdex^6\log(c)}{3}+\frac{be^2nx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**4/4 + a*d*e*x**6/3 + a*e**2*x**8/8 + b*d**2*n*x**4*log(x)/4 - b*d
**2*n*x**4/16 + b*d**2*x**4*log(c)/4 + b*d*e*n*x**6*log(x)/3 - b*d*e*n*x**6
/18 + b*d*e*x**6*log(c)/3 + b*e**2*n*x**8*log(x)/8 - b*e**2*n*x**8/64 + b*e
**2*x**8*log(c)/8
```

3.185 $\int x\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=76

$$\frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{6e}-\frac{bd^3n\log(x)}{6e}-\frac{1}{4}bd^2nx^2-\frac{1}{8}bdenx^4-\frac{1}{36}be^2nx^6$$

```
[Out] -1/4*b*d^2*n*x^2-1/8*b*d*e*n*x^4-1/36*b*e^2*n*x^6-1/6*b*d^3*n*ln(x)/e+1/6*(
e*x^2+d)^3*(a+b*ln(c*x^n))/e
```

Rubi [A] time = 0.07, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {261, 2334, 12, 266, 43}

$$\frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{6e}-\frac{bd^3n\log(x)}{6e}-\frac{1}{4}bd^2nx^2-\frac{1}{8}bdenx^4-\frac{1}{36}be^2nx^6$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^2)/4 - (b*d*e*n*x^4)/8 - (b*e^2*n*x^6)/36 - (b*d^3*n*Log[x])/(6
*e) + ((d + e*x^2)^3*(a + b*Log[c*x^n]))/(6*e)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)dx=\frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{6e}-(bn)\int\frac{\left(d+ex^2\right)^3}{6ex}dx$$

$$=\frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{6e}-\frac{(bn)\int\frac{\left(d+ex^2\right)^3}{x}dx}{6e}$$

$$=\frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{6e}-\frac{(bn)\,\text{Subst}\left(\int\frac{(d+ex)^3}{x}dx,x,x^2\right)}{12e}$$

$$=\frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{6e}-\frac{(bn)\,\text{Subst}\left(\int\left(3d^2e+\frac{d^3}{x}+3de^2x+e^3x^2\right)\right.}{12e}$$

$$=-\frac{1}{4}bd^2nx^2-\frac{1}{8}bdenx^4-\frac{1}{36}be^2nx^6-\frac{bd^3n\log(x)}{6e}+\frac{\left(d+ex^2\right)^3\left(a+b\log\right.}{6e}$$

Mathematica [A] time = 0.05, size = 85, normalized size = 1.12

$$\frac{1}{72}x^2\left(12a\left(3d^2+3dex^2+e^2x^4\right)+12b\left(3d^2+3dex^2+e^2x^4\right)\log\left(cx^n\right)-bn\left(18d^2+9dex^2+2e^2x^4\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(12*a*(3*d^2 + 3*d*e*x^2 + e^2*x^4) - b*n*(18*d^2 + 9*d*e*x^2 + 2*e^2*
x^4) + 12*b*(3*d^2 + 3*d*e*x^2 + e^2*x^4)*Log[c*x^n]))/72
```

fricas [A] time = 0.53, size = 116, normalized size = 1.53

$$-\frac{1}{36}\left(be^2n-6\,ae^2\right)x^6-\frac{1}{8}\left(bden-4\,ade\right)x^4-\frac{1}{4}\left(bd^2n-2\,ad^2\right)x^2+\frac{1}{6}\left(be^2x^6+3\,bdex^4+3\,bd^2x^2\right)\log(c)+\frac{1}{6}\left(be^2nx\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/36*(b*e^2*n - 6*a*e^2)*x^6 - 1/8*(b*d*e*n - 4*a*d*e)*x^4 - 1/4*(b*d^2*n
- 2*a*d^2)*x^2 + 1/6*(b*e^2*x^6 + 3*b*d*e*x^4 + 3*b*d^2*x^2)*log(c) + 1/6*(
b*e^2*n*x^6 + 3*b*d*e*n*x^4 + 3*b*d^2*n*x^2)*log(x)
```

giac [A] time = 0.33, size = 123, normalized size = 1.62

$$\frac{1}{6}bnx^6e^2\log(x)-\frac{1}{36}bnx^6e^2+\frac{1}{6}bx^6e^2\log(c)+\frac{1}{2}bdnx^4e\log(x)+\frac{1}{6}ax^6e^2-\frac{1}{8}bdnx^4e+\frac{1}{2}bdx^4e\log(c)+\frac{1}{2}adx^4e+\frac{1}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/6*b*n*x^6*e^2*log(x) - 1/36*b*n*x^6*e^2 + 1/6*b*x^6*e^2*log(c) + 1/2*b*d*
n*x^4*e*log(x) + 1/6*a*x^6*e^2 - 1/8*b*d*n*x^4*e + 1/2*b*d*x^4*e*log(c) + 1
/2*a*d*x^4*e + 1/2*b*d^2*n*x^2*log(x) - 1/4*b*d^2*n*x^2 + 1/2*b*d^2*x^2*log
(c) + 1/2*a*d^2*x^2
```

maple [C] time = 0.22, size = 433, normalized size = 5.70

$$-\frac{i\pi b\,e^2x^6\text{csgn}\left(ic\right)\text{csgn}\left(ix^n\right)\text{csgn}\left(ic\,x^n\right)}{12}+\frac{i\pi b\,e^2x^6\text{csgn}\left(ic\right)\text{csgn}\left(ic\,x^n\right)^2}{12}+\frac{i\pi b\,e^2x^6\text{csgn}\left(ix^n\right)\text{csgn}\left(ic\,x^n\right)^2}{12}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/6*b*x^2*(e^2*x^4+3*d*e*x^2+3*d^2)*ln(x^n)-1/12*I*Pi*b*e^2*x^6*csgn(I*c*x^
n)^3-1/4*I*Pi*b*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4*I*Pi*b*d*e*
x^4*csgn(I*c*x^n)^3+1/4*I*Pi*b*d^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/6*b*e^2*
x^6*ln(c)-1/36*b*e^2*n*x^6+1/6*a*e^2*x^6+1/12*I*Pi*b*e^2*x^6*csgn(I*x^n)*cs
gn(I*c*x^n)^2+1/12*I*Pi*b*e^2*x^6*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*Pi*b*d^2*
x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*Pi*b*d*e*x^4*csgn(I*c*x^n)^2*csgn(I*c
)+1/2*b*d*e*x^4*ln(c)-1/8*b*d*e*n*x^4+1/2*a*d*e*x^4-1/4*I*Pi*b*d^2*x^2*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4*I*Pi*b*d^2*x^2*csgn(I*c*x^n)^3+1/4*I*Pi
*b*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-1/12*I*Pi*b*e^2*x^6*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)+1/2*b*d^2*x^2*ln(c)-1/4*b*d^2*n*x^2+1/2*a*d^2*x^2
```

maxima [**A**] time = 0.46, size = 100, normalized size = 1.32

$$-\frac{1}{36}\,be^2nx^6+\frac{1}{6}\,be^2x^6\log\left(cx^n\right)+\frac{1}{6}\,ae^2x^6-\frac{1}{8}\,bdenx^4+\frac{1}{2}\,bdex^4\log\left(cx^n\right)+\frac{1}{2}\,adex^4-\frac{1}{4}\,bd^2nx^2+\frac{1}{2}\,bd^2x^2\log\left(cx^n\right)+\frac{1}{2}\,a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/36*b*e^2*n*x^6 + 1/6*b*e^2*x^6*log(c*x^n) + 1/6*a*e^2*x^6 - 1/8*b*d*e*n*
x^4 + 1/2*b*d*e*x^4*log(c*x^n) + 1/2*a*d*e*x^4 - 1/4*b*d^2*n*x^2 + 1/2*b*d^
2*x^2*log(c*x^n) + 1/2*a*d^2*x^2
```

mupad [**B**] time = 3.63, size = 82, normalized size = 1.08

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^2\,x^2}{2}+\frac{b\,d\,e\,x^4}{2}+\frac{b\,e^2\,x^6}{6}\right)+\frac{d^2\,x^2\,\left(2\,a-b\,n\right)}{4}+\frac{e^2\,x^6\,\left(6\,a-b\,n\right)}{36}+\frac{d\,e\,x^4\,\left(4\,a-b\,n\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d + e*x^2)^2*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d^2*x^2)/2 + (b*e^2*x^6)/6 + (b*d*e*x^4)/2) + (d^2*x^2*(2*a
- b*n))/4 + (e^2*x^6*(6*a - b*n))/36 + (d*e*x^4*(4*a - b*n))/8
```

sympy [**B**] time = 3.91, size = 151, normalized size = 1.99

$$\frac{ad^2x^2}{2}+\frac{adex^4}{2}+\frac{ae^2x^6}{6}+\frac{bd^2nx^2\log\left(x\right)}{2}-\frac{bd^2nx^2}{4}+\frac{bd^2x^2\log\left(c\right)}{2}+\frac{bdenx^4\log\left(x\right)}{2}-\frac{bdenx^4}{8}+\frac{bdex^4\log\left(c\right)}{2}+\frac{be^2nx^6\,\mathrm{lo}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**2/2 + a*d*e*x**4/2 + a*e**2*x**6/6 + b*d**2*n*x**2*log(x)/2 - b*d
**2*n*x**2/4 + b*d**2*x**2*log(c)/2 + b*d*e*n*x**4*log(x)/2 - b*d*e*n*x**4/
8 + b*d*e*x**4*log(c)/2 + b*e**2*n*x**6*log(x)/6 - b*e**2*n*x**6/36 + b*e**
2*x**6*log(c)/6
```

3.186 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=89

$$d^2\log(x)\left(a+b\log\left(cx^n\right)\right)+dex^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}e^2x^4\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^2n\log^2(x)-\frac{1}{2}bdenx^2-\frac{1}{16}be^2nx$$

```
[Out] -1/2*b*d*e*n*x^2-1/16*b*e^2*n*x^4-1/2*b*d^2*n*ln(x)^2+d*e*x^2*(a+b*ln(c*x^n
))+1/4*e^2*x^4*(a+b*ln(c*x^n))+d^2*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.08, antiderivative size = 73, normalized size of antiderivative = 0.82, number of steps used = 3, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {266, 43, 2334, 2301}

$$\frac{1}{4}\left(4d^2\log(x)+4dex^2+e^2x^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^2n\log^2(x)-\frac{1}{2}bdenx^2-\frac{1}{16}be^2nx^4$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -(b*d*e*n*x^2)/2 - (b*e^2*n*x^4)/16 - (b*d^2*n*Log[x]^2)/2 + ((4*d*e*x^2 +
e^2*x^4 + 4*d^2*Log[x])*(a + b*Log[c*x^n]))/4
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int\frac{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)}{x}\,dx&=\frac{1}{4}\left(4dex^2+e^2x^4+4d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(dex+\frac{e^2x^3}{4}+\frac{d}{}\right.\\&=-\frac{1}{2}bdenx^2-\frac{1}{16}be^2nx^4+\frac{1}{4}\left(4dex^2+e^2x^4+4d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)\\&=-\frac{1}{2}bdenx^2-\frac{1}{16}be^2nx^4-\frac{1}{2}bd^2n\log^2(x)+\frac{1}{4}\left(4dex^2+e^2x^4+4d^2\log(x)\right)\left(\right.\end{aligned}$$

Mathematica [A] time = 0.08, size = 82, normalized size = 0.92

$$\frac{1}{16}\left(\frac{8d^2\left(a+b\log\left(cx^n\right)\right)^2}{bn}+16dex^2\left(a+b\log\left(cx^n\right)\right)+4e^2x^4\left(a+b\log\left(cx^n\right)\right)-8bdenx^2-be^2nx^4\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-8*b*d*e*n*x^2 - b*e^2*n*x^4 + 16*d*e*x^2*(a + b*Log[c*x^n]) + 4*e^2*x^4*(
a + b*Log[c*x^n]) + (8*d^2*(a + b*Log[c*x^n])^2)/(b*n))/16
```

fricas [A] time = 0.47, size = 104, normalized size = 1.17

$$\frac{1}{2}\,bd^2n\log(x)^2-\frac{1}{16}\left(be^2n-4\,ae^2\right)x^4-\frac{1}{2}\left(bden-2\,ade\right)x^2+\frac{1}{4}\left(be^2x^4+4\,bdex^2\right)\log(c)+\frac{1}{4}\left(be^2nx^4+4\,bdenx^2+4\,bd\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/2*b*d^2*n*log(x)^2 - 1/16*(b*e^2*n - 4*a*e^2)*x^4 - 1/2*(b*d*e*n - 2*a*d*
e)*x^2 + 1/4*(b*e^2*x^4 + 4*b*d*e*x^2)*log(c) + 1/4*(b*e^2*n*x^4 + 4*b*d*e*
n*x^2 + 4*b*d^2*log(c) + 4*a*d^2)*log(x)
```

giac [A] time = 0.30, size = 105, normalized size = 1.18

$$\frac{1}{4}\,bnx^4e^2\log(x)-\frac{1}{16}\,bnx^4e^2+\frac{1}{4}\,bx^4e^2\log(c)+bdnx^2e\log(x)+\frac{1}{4}\,ax^4e^2-\frac{1}{2}\,bdnx^2e+bdx^2e\log(c)+\frac{1}{2}\,bd^2n\log(x)^2+ad$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/4*b*n*x^4*e^2*log(x) - 1/16*b*n*x^4*e^2 + 1/4*b*x^4*e^2*log(c) + b*d*n*x^
2*e*log(x) + 1/4*a*x^4*e^2 - 1/2*b*d*n*x^2*e + b*d*x^2*e*log(c) + 1/2*b*d^2
*n*log(x)^2 + a*d*x^2*e + b*d^2*log(c)*log(x) + a*d^2*log(x)
```

maple [C] time = 0.30, size = 423, normalized size = 4.75

$$-\frac{i\pi b\,e^2x^4\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)}{8}+\frac{i\pi b\,e^2x^4\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ic\,x^n)^2}{8}+\frac{i\pi b\,e^2x^4\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)^2}{8}-\frac{i\pi b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] (1/4*b*e^2*x^4+b*d*e*x^2+b*d^2*ln(x))*ln(x^n)-1/2*b*d^2*n*ln(x)^2-1/8*I*Pi*
b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*b*d*e*x^2*csgn(I*c*x
^n)^3+1/2*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/8*I*Pi*b*e^2*x^4*csg
n(I*x^n)*csgn(I*c*x^n)^2+1/2*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I
*Pi*ln(x)*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*Pi*ln(x)*b*d^2*cs
gn(I*c*x^n)^2*csgn(I*c)+1/2*I*Pi*ln(x)*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/
4*b*e^2*x^4*ln(c)-1/16*b*e^2*n*x^4+1/4*a*e^2*x^4+ln(c)*b*d*e*x^2-1/2*b*d*e*
n*x^2+a*d*e*x^2-1/8*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3-1/2*I*Pi*b*d*e*x^2*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/8*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)
-1/2*I*Pi*ln(x)*b*d^2*csgn(I*c*x^n)^3+b*d^2*ln(c)*ln(x)+a*d^2*ln(x)
```

maxima [A] time = 0.47, size = 88, normalized size = 0.99

$$-\frac{1}{16}\,be^2nx^4+\frac{1}{4}\,be^2x^4\log\left(cx^n\right)+\frac{1}{4}\,ae^2x^4-\frac{1}{2}\,bdenx^2+bdex^2\log\left(cx^n\right)+adex^2+\frac{bd^2\log\left(cx^n\right)^2}{2\,n}+ad^2\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] -1/16*b*e^2*n*x^4 + 1/4*b*e^2*x^4*log(c*x^n) + 1/4*a*e^2*x^4 - 1/2*b*d*e*n*
x^2 + b*d*e*x^2*log(c*x^n) + a*d*e*x^2 + 1/2*b*d^2*log(c*x^n)^2/n + a*d^2*l
og(x)
```

mupad [B] time = 3.66, size = 80, normalized size = 0.90

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,e^2\,x^4}{4}+b\,d\,e\,x^2\right)+\frac{e^2\,x^4\,\left(4\,a-b\,n\right)}{16}+a\,d^2\,\ln(x)+\frac{b\,d^2\,{\ln\left(c\,x^n\right)}^2}{2\,n}+\frac{d\,e\,x^2\,\left(2\,a-b\,n\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^2*(a + b*log(c*x^n)))/x,x)
```

```
[Out] log(c*x^n)*((b*e^2*x^4)/4 + b*d*e*x^2) + (e^2*x^4*(4*a - b*n))/16 + a*d^2*l
og(x) + (b*d^2*log(c*x^n)^2)/(2*n) + (d*e*x^2*(2*a - b*n))/2
```

sympy [A] time = 2.61, size = 129, normalized size = 1.45

$$ad^2\log(x)+adex^2+\frac{ae^2x^4}{4}+\frac{bd^2n\log(x)^2}{2}+bd^2\log(c)\log(x)+bdenx^2\log(x)-\frac{bdenx^2}{2}+bdex^2\log(c)+\frac{be^2nx^4\log}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x,x)
```

```
[Out] a*d**2*log(x) + a*d*e*x**2 + a*e**2*x**4/4 + b*d**2*n*log(x)**2/2 + b*d**2*
log(c)*log(x) + b*d*e*n*x**2*log(x) - b*d*e*n*x**2/2 + b*d*e*x**2*log(c) +
b*e**2*n*x**4*log(x)/4 - b*e**2*n*x**4/16 + b*e**2*x**4*log(c)/4
```

3.187 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=91

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2x^2}+2de\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}e^2x^2\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{4x^2}-bden\log^2(x)-\frac{1}{4}be^2nx^2$$

```
[Out] -1/4*b*d^2*n/x^2-1/4*b*e^2*n*x^2-b*d*e*n*ln(x)^2-1/2*d^2*(a+b*ln(c*x^n))/x^
2+1/2*e^2*x^2*(a+b*ln(c*x^n))+2*d*e*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.10, antiderivative size = 71, normalized size of antiderivative = 0.78, number of steps used = 7, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {266, 43, 2334, 12, 14, 2301}

$$-\frac{1}{2}\left(\frac{d^2}{x^2}-4de\log(x)-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{4x^2}-bden\log^2(x)-\frac{1}{4}be^2nx^2$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d^2*n)/(4*x^2) - (b*e^2*n*x^2)/4 - b*d*e*n*Log[x]^2 - ((d^2/x^2 - e^2*x
^2 - 4*d*e*Log[x])*(a + b*Log[c*x^n]))/2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
```

```
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx = -\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{-d^2+e^2x^4+4dex}{2x^3}$$
$$= -\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int\frac{-d^2+e^2x^4+4d}{x^3}$$
$$= -\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int\left(\frac{-d^2+e^2x^4}{x^3}+\right.$$
$$= -\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int\frac{-d^2+e^2x^4}{x^3}\,dx-$$
$$= -bden\log^2(x)-\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int\Bigg($$
$$= -\frac{bd^2n}{4x^2}-\frac{1}{4}be^2nx^2-bden\log^2(x)-\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)\left(a+b\log\right.$$

Mathematica [A] time = 0.06, size = 83, normalized size = 0.91

$$\frac{1}{4}\left(-\frac{2d^2\left(a+b\log\left(cx^n\right)\right)}{x^2}+\frac{4de\left(a+b\log\left(cx^n\right)\right)^2}{bn}+2e^2x^2\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{x^2}-be^2nx^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] (-((b*d^2*n)/x^2) - b*e^2*n*x^2 - (2*d^2*(a + b*Log[c*x^n]))/x^2 + 2*e^2*x^
2*(a + b*Log[c*x^n]) + (4*d*e*(a + b*Log[c*x^n])^2)/(b*n))/4
```

fricas [A] time = 0.47, size = 108, normalized size = 1.19

$$\frac{4\,bdenx^2\log(x)^2-\left(be^2n-2\,ae^2\right)x^4-bd^2n-2\,ad^2+2\left(be^2x^4-bd^2\right)\log(c)+2\left(be^2nx^4+4\,bdex^2\log(c)+4\,a\right.}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(4*b*d*e*n*x^2*log(x)^2 - (b*e^2*n - 2*a*e^2)*x^4 - b*d^2*n - 2*a*d^2 +
 2*(b*e^2*x^4 - b*d^2)*log(c) + 2*(b*e^2*n*x^4 + 4*b*d*e*x^2*log(c) + 4*a*d
*e*x^2 - b*d^2*n)*log(x))/x^2
```

giac [A] time = 0.26, size = 112, normalized size = 1.23

$$\frac{2\,bnx^4e^2\log(x)+4\,bdnx^2e\log(x)^2-bnx^4e^2+2\,bx^4e^2\log(c)+8\,bdx^2e\log(c)\log(x)+2\,ax^4e^2+8\,adx^2e\log(x}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] 1/4*(2*b*n*x^4*e^2*log(x) + 4*b*d*n*x^2*e*log(x)^2 - b*n*x^4*e^2 + 2*b*x^4*
e^2*log(c) + 8*b*d*x^2*e*log(c)*log(x) + 2*a*x^4*e^2 + 8*a*d*x^2*e*log(x) -
 2*b*d^2*n*log(x) - b*d^2*n - 2*b*d^2*log(c) - 2*a*d^2)/x^2
```

maple [C] time = 0.32, size = 433, normalized size = 4.76

$$-\frac{\left(-e^{2}x^{4}-4de\,x^{2}\ln(x)+d^{2}\right)b\ln\left(x^{n}\right)}{2x^{2}}-\frac{i\pi b\,e^{2}x^{4}\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)-i\pi b\,e^{2}x^{4}\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^{n}\right)^{2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(b*ln(c*x^n)+a)/x^3,x)
```

```
[Out] -1/2*b*(-e^2*x^4-4*d*e*ln(x)*x^2+d^2)/x^2*ln(x^n)-1/4*(-I*Pi*b*e^2*x^4*csgn
(I*c*x^n)^2*csgn(I*c)-4*I*ln(x)*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^2+I*Pi
*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+4*I*ln(x)*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*x^2-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*I*ln(x)
*Pi*b*d*e*csgn(I*c*x^n)^3*x^2+I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*e
^2*x^4*csgn(I*c*x^n)^3-2*b*e^2*x^4*ln(c)-I*Pi*b*d^2*csgn(I*c*x^n)^3-I*Pi*b*
e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)-4*I*ln(x)*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^2+4*b*d*e*n*ln
(x)^2*x^2+b*e^2*n*x^4-8*ln(x)*ln(c)*b*d*e*x^2-2*a*e^2*x^4-8*ln(x)*a*d*e*x^2
+2*b*d^2*ln(c)+b*d^2*n+2*a*d^2)/x^2
```

maxima [A] time = 0.49, size = 91, normalized size = 1.00

$$-\frac{1}{4}\,be^{2}nx^{2}+\frac{1}{2}\,be^{2}x^{2}\log\left(cx^{n}\right)+\frac{1}{2}\,ae^{2}x^{2}+\frac{bde\log\left(cx^{n}\right)^{2}}{n}+2\,ade\log(x)-\frac{bd^{2}n}{4\,x^{2}}-\frac{bd^{2}\log\left(cx^{n}\right)}{2\,x^{2}}-\frac{ad^{2}}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] -1/4*b*e^2*n*x^2 + 1/2*b*e^2*x^2*log(c*x^n) + 1/2*a*e^2*x^2 + b*d*e*log(c*x
^n)^2/n + 2*a*d*e*log(x) - 1/4*b*d^2*n/x^2 - 1/2*b*d^2*log(c*x^n)/x^2 - 1/2
*a*d^2/x^2
```

mupad [B] time = 3.74, size = 110, normalized size = 1.21

$$\ln(x)\,\left(2\,a\,d\,e+b\,d\,e\,n\right)-\frac{\frac{a\,d^2}{2}+\frac{b\,d^2\,n}{4}}{x^2}-\ln\left(c\,x^n\right)\,\left(\frac{\frac{b\,d^2}{2}+b\,d\,e\,x^2+\frac{b\,e^2\,x^4}{2}}{x^2}-b\,e^2\,x^2\right)+\frac{e^2\,x^2\,\left(2\,a-b\,n\right)}{4}+\frac{b\,d\,e\ln\left(c\,x^n\right)^2}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^2*(a + b*log(c*x^n)))/x^3,x)
```

```
[Out] log(x)*(2*a*d*e + b*d*e*n) - ((a*d^2)/2 + (b*d^2*n)/4)/x^2 - log(c*x^n)*(((
b*d^2)/2 + (b*e^2*x^4)/2 + b*d*e*x^2)/x^2 - b*e^2*x^2) + (e^2*x^2*(2*a - b*
n))/4 + (b*d*e*log(c*x^n)^2)/n
```

sympy [A] time = 2.75, size = 136, normalized size = 1.49

$$-\frac{ad^{2}}{2x^{2}}+2ade\log\left(x\right)+\frac{ae^{2}x^{2}}{2}-\frac{bd^{2}n\log\left(x\right)}{2x^{2}}-\frac{bd^{2}n}{4x^{2}}-\frac{bd^{2}\log\left(c\right)}{2x^{2}}+bden\log\left(x\right)^{2}+2bde\log\left(c\right)\log\left(x\right)+\frac{be^{2}nx^{2}\log\left(x\right)}{2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] -a*d**2/(2*x**2) + 2*a*d*e*log(x) + a*e**2*x**2/2 - b*d**2*n*log(x)/(2*x**2
) - b*d**2*n/(4*x**2) - b*d**2*log(c)/(2*x**2) + b*d*e*n*log(x)**2 + 2*b*d*
e*log(c)*log(x) + b*e**2*n*x**2*log(x)/2 - b*e**2*n*x**2/4 + b*e**2*x**2*lo
g(c)/2
```

3.188 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=90

$$-\frac{d^2(a+b\log(cx^n))}{4x^4}-\frac{de(a+b\log(cx^n))}{x^2}+e^2\log(x)(a+b\log(cx^n))-\frac{bd^2n}{16x^4}-\frac{bden}{2x^2}-\frac{1}{2}be^2n\log^2(x)$$

```
[Out] -1/16*b*d^2*n/x^4-1/2*b*d*e*n/x^2-1/2*b*e^2*n*ln(x)^2-1/4*d^2*(a+b*ln(c*x^n
))/x^4-d*e*(a+b*ln(c*x^n))/x^2+e^2*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.09, antiderivative size = 73, normalized size of antiderivative = 0.81, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {266, 43, 2334, 14, 2301}

$$-\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{4de}{x^2}-4e^2\log(x)\right)(a+b\log(cx^n))-\frac{bd^2n}{16x^4}-\frac{bden}{2x^2}-\frac{1}{2}be^2n\log^2(x)$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d^2*n)/(16*x^4) - (b*d*e*n)/(2*x^2) - (b*e^2*n*Log[x]^2)/2 - ((d^2/x^4
+ (4*d*e)/x^2 - 4*e^2*Log[x])*(a + b*Log[c*x^n]))/4
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2 \left(a+b\log\left(cx^n\right)\right)}{x^5}\,dx = -\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{4de}{x^2}-4e^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(-\frac{d\left(d+4ex^2\right)}{4x^5}+\frac{e^2 1}{}\right.$$
$$= -\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{4de}{x^2}-4e^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}(bdn)\int\frac{d+4ex^2}{x^5}\,dx-\left(be^2\right.$$
$$= -\frac{1}{2}be^2n\log^2(x)-\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{4de}{x^2}-4e^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}(bdn)\int\left(\right.$$
$$= -\frac{bd^2n}{16x^4}-\frac{bden}{2x^2}-\frac{1}{2}be^2n\log^2(x)-\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{4de}{x^2}-4e^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right.$$

Mathematica [A] time = 0.06, size = 82, normalized size = 0.91

$$\frac{1}{16}\left(-\frac{4d^2\left(a+b\log\left(cx^n\right)\right)}{x^4}-\frac{16de\left(a+b\log\left(cx^n\right)\right)}{x^2}+\frac{8e^2\left(a+b\log\left(cx^n\right)\right)^2}{bn}-\frac{bd^2n}{x^4}-\frac{8bden}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] (-((b*d^2*n)/x^4) - (8*b*d*e*n)/x^2 - (4*d^2*(a + b*Log[c*x^n]))/x^4 - (16*
d*e*(a + b*Log[c*x^n]))/x^2 + (8*e^2*(a + b*Log[c*x^n])^2)/(b*n))/16
```

fricas [A] time = 0.59, size = 108, normalized size = 1.20

$$\frac{8\,be^2nx^4\log(x)^2-bd^2n-4\,ad^2-8\,(bden+2\,ade)x^2-4\left(4\,bdex^2+bd^2\right)\log(c)+4\left(4\,be^2x^4\log(c)+4\,ae^2x^4-4\,b\right.}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] 1/16*(8*b*e^2*n*x^4*log(x)^2 - b*d^2*n - 4*a*d^2 - 8*(b*d*e*n + 2*a*d*e)*x^
2 - 4*(4*b*d*e*x^2 + b*d^2)*log(c) + 4*(4*b*e^2*x^4*log(c) + 4*a*e^2*x^4 -
4*b*d*e*n*x^2 - b*d^2*n)*log(x))/x^4
```

giac [A] time = 0.31, size = 113, normalized size = 1.26

$$\frac{8\,bnx^4e^2\log(x)^2+16\,bx^4e^2\log(c)\log(x)+16\,ax^4e^2\log(x)-16\,bdnx^2e\log(x)-8\,bdnx^2e-16\,bdx^2e\log(c)-16\,a}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] 1/16*(8*b*n*x^4*e^2*log(x)^2 + 16*b*x^4*e^2*log(c)*log(x) + 16*a*x^4*e^2*lo
g(x) - 16*b*d*n*x^2*e*log(x) - 8*b*d*n*x^2*e - 16*b*d*x^2*e*log(c) - 16*a*d
*x^2*e - 4*b*d^2*n*log(x) - b*d^2*n - 4*b*d^2*log(c) - 4*a*d^2)/x^4
```

maple [C] time = 0.25, size = 434, normalized size = 4.82

$$-\frac{\left(-4e^2x^4\ln(x)+4dex^2+d^2\right)b\ln\left(x^n\right)}{4x^4}-\frac{8i\pi b\,e^2x^4\operatorname{csgn}(ic)\operatorname{csgn}\left(ix^n\right)\operatorname{csgn}\left(ic\,x^n\right)\ln(x)-8i\pi b\,e^2x^4\operatorname{csgn}(ic)\operatorname{csgr}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(b*ln(c*x^n)+a)/x^5,x)
```

```
[Out] -1/4*b*(-4*e^2*ln(x)*x^4+4*d*e*x^2+d^2)/x^4*ln(x^n)-1/16*(8*I*ln(x)*Pi*b*e^
2*csgn(I*c*x^n)^3*x^4-8*I*ln(x)*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*x^4+2*I*
Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)-8*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+8*I*Pi*b*d*e*
x^2*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+8*I*
Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+8*b*e^2*n*ln(x)^2*x^4-16*ln(x)*ln(
c)*b*e^2*x^4+8*I*ln(x)*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^4-2*I
*Pi*b*d^2*csgn(I*c*x^n)^3-8*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^3-8*I*ln(x)*Pi*b*e
^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^4-16*ln(x)*a*e^2*x^4+16*b*d*e*x^2*ln(c)+8*
b*d*e*n*x^2+16*a*d*e*x^2+4*b*d^2*ln(c)+b*d^2*n+4*a*d^2)/x^4
```

maxima [A] time = 0.52, size = 90, normalized size = 1.00

$$\frac{be^2\log(cx^n)^2}{2n}+ae^2\log(x)-\frac{bden}{2x^2}-\frac{bde\log(cx^n)}{x^2}-\frac{ade}{x^2}-\frac{bd^2n}{16x^4}-\frac{bd^2\log(cx^n)}{4x^4}-\frac{ad^2}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] 1/2*b*e^2*log(c*x^n)^2/n + a*e^2*log(x) - 1/2*b*d*e*n/x^2 - b*d*e*log(c*x^n
)/x^2 - a*d*e/x^2 - 1/16*b*d^2*n/x^4 - 1/4*b*d^2*log(c*x^n)/x^4 - 1/4*a*d^2
/x^4
```

mupad [B] time = 3.57, size = 102, normalized size = 1.13

$$\ln(x)\left(ae^2+\frac{3be^2n}{4}\right)-\frac{x^2\,(4ade+2bden)+ad^2+\frac{bd^2n}{4}}{4x^4}-\frac{\ln(cx^n)\left(\frac{bd^2}{4}+bdex^2+\frac{3be^2x^4}{4}\right)}{x^4}+\frac{be^2\ln(cx^n)^2}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^2*(a + b*log(c*x^n)))/x^5,x)
```

```
[Out] log(x)*(a*e^2 + (3*b*e^2*n)/4) - (x^2*(4*a*d*e + 2*b*d*e*n) + a*d^2 + (b*d^
2*n)/4)/(4*x^4) - (log(c*x^n)*((b*d^2)/4 + (3*b*e^2*x^4)/4 + b*d*e*x^2))/x^
4 + (b*e^2*log(c*x^n)^2)/(2*n)
```

sympy [A] time = 6.17, size = 105, normalized size = 1.17

$$-\frac{ad^2}{4x^4}-\frac{ade}{x^2}+ae^2\log(x)+bd^2\left(-\frac{n}{16x^4}-\frac{\log(cx^n)}{4x^4}\right)+2bde\left(-\frac{n}{4x^2}-\frac{\log(cx^n)}{2x^2}\right)-be^2\left(\begin{cases}-\log(c)\log(x) & \text{for } n = \\ -\frac{\log(cx^n)^2}{2n} & \text{otherw}\end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] -a*d**2/(4*x**4) - a*d*e/x**2 + a*e**2*log(x) + b*d**2*(-n/(16*x**4) - log(
c*x**n)/(4*x**4)) + 2*b*d*e*(-n/(4*x**2) - log(c*x**n)/(2*x**2)) - b*e**2*P
iecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True))
```

3.189 $\int x^4 \left(d+ex^2\right)^2 \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=74

$$\frac{1}{315}\left(63d^2x^5+90dex^7+35e^2x^9\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bd^2nx^5-\frac{2}{49}bdenx^7-\frac{1}{81}be^2nx^9$$

```
[Out] -1/25*b*d^2*n*x^5-2/49*b*d*e*n*x^7-1/81*b*e^2*n*x^9+1/315*(35*e^2*x^9+90*d*
e*x^7+63*d^2*x^5)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.07, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$\frac{1}{315}\left(63d^2x^5+90dex^7+35e^2x^9\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bd^2nx^5-\frac{2}{49}bdenx^7-\frac{1}{81}be^2nx^9$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^5)/25 - (2*b*d*e*n*x^7)/49 - (b*e^2*n*x^9)/81 + ((63*d^2*x^5 +
90*d*e*x^7 + 35*e^2*x^9)*(a + b*Log[c*x^n]))/315
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int x^4\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)dx&=\frac{1}{315}\left(63d^2x^5+90dex^7+35e^2x^9\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(\frac{d^2x^4}{5}+\frac{2}{7}dex\right.\\&=-\frac{1}{25}bd^2nx^5-\frac{2}{49}bdenx^7-\frac{1}{81}be^2nx^9+\frac{1}{315}\left(63d^2x^5+90dex^7+35e^2x^9\right)\left(\right.\end{aligned}$$

Mathematica [A] time = 0.04, size = 95, normalized size = 1.28

$$\frac{1}{5}d^2x^5\left(a+b\log\left(cx^n\right)\right)+\frac{2}{7}dex^7\left(a+b\log\left(cx^n\right)\right)+\frac{1}{9}e^2x^9\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bd^2nx^5-\frac{2}{49}bdenx^7-\frac{1}{81}be^2nx^9$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -1/25*(b*d^2*n*x^5) - (2*b*d*e*n*x^7)/49 - (b*e^2*n*x^9)/81 + (d^2*x^5*(a +
 b*Log[c*x^n]))/5 + (2*d*e*x^7*(a + b*Log[c*x^n]))/7 + (e^2*x^9*(a + b*Log[
c*x^n]))/9
```

fricas [A] time = 0.58, size = 118, normalized size = 1.59

$$-\frac{1}{81}\left(be^2n-9\,ae^2\right)x^9-\frac{2}{49}\,(bden-7\,ade)x^7-\frac{1}{25}\left(bd^2n-5\,ad^2\right)x^5+\frac{1}{315}\left(35\,be^2x^9+90\,bdex^7+63\,bd^2x^5\right)\log(c)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/81*(b*e^2*n - 9*a*e^2)*x^9 - 2/49*(b*d*e*n - 7*a*d*e)*x^7 - 1/25*(b*d^2*
n - 5*a*d^2)*x^5 + 1/315*(35*b*e^2*x^9 + 90*b*d*e*x^7 + 63*b*d^2*x^5)*log(c
) + 1/315*(35*b*e^2*n*x^9 + 90*b*d*e*n*x^7 + 63*b*d^2*n*x^5)*log(x)
```

giac [A] time = 0.39, size = 123, normalized size = 1.66

$$\frac{1}{9}\,bnx^9e^2\log(x)-\frac{1}{81}\,bnx^9e^2+\frac{1}{9}\,bx^9e^2\log(c)+\frac{2}{7}\,bdnx^7e\log(x)+\frac{1}{9}\,ax^9e^2-\frac{2}{49}\,bdnx^7e+\frac{2}{7}\,bdx^7e\log(c)+\frac{2}{7}\,adx^7e+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/9*b*n*x^9*e^2*log(x) - 1/81*b*n*x^9*e^2 + 1/9*b*x^9*e^2*log(c) + 2/7*b*d*
n*x^7*e*log(x) + 1/9*a*x^9*e^2 - 2/49*b*d*n*x^7*e + 2/7*b*d*x^7*e*log(c) +
2/7*a*d*x^7*e + 1/5*b*d^2*n*x^5*log(x) - 1/25*b*d^2*n*x^5 + 1/5*b*d^2*x^5*l
og(c) + 1/5*a*d^2*x^5
```

maple [C] time = 0.22, size = 434, normalized size = 5.86

$$-\frac{i\pi b\,e^2x^9\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)}{18}+\frac{i\pi b\,e^2x^9\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ic\,x^n)^2}{18}+\frac{i\pi b\,e^2x^9\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)^2}{18}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/315*b*x^5*(35*e^2*x^4+90*d*e*x^2+63*d^2)*ln(x^n)+1/18*I*Pi*b*e^2*x^9*csgn
(I*x^n)*csgn(I*c*x^n)^2+1/10*I*Pi*b*d^2*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/7*I
*Pi*b*d*e*x^7*csgn(I*x^n)*csgn(I*c*x^n)^2+1/10*I*Pi*b*d^2*x^5*csgn(I*x^n)*c
sgn(I*c*x^n)^2+1/9*ln(c)*b*e^2*x^9-1/81*b*e^2*n*x^9+1/9*a*e^2*x^9-1/18*I*Pi
*b*e^2*x^9*csgn(I*c*x^n)^3-1/7*I*Pi*b*d*e*x^7*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)-1/10*I*Pi*b*d^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/10*I*Pi*b*
d^2*x^5*csgn(I*c*x^n)^3+2/7*ln(c)*b*d*e*x^7-2/49*b*d*e*n*x^7+2/7*a*d*e*x^7+
1/18*I*Pi*b*e^2*x^9*csgn(I*c*x^n)^2*csgn(I*c)-1/7*I*Pi*b*d*e*x^7*csgn(I*c*x
^n)^3+1/7*I*Pi*b*d*e*x^7*csgn(I*c*x^n)^2*csgn(I*c)-1/18*I*Pi*b*e^2*x^9*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/5*ln(c)*b*d^2*x^5-1/25*b*d^2*n*x^5+1/5*a*
d^2*x^5
```

maxima [A] time = 0.48, size = 100, normalized size = 1.35

$$-\frac{1}{81}\,be^2nx^9+\frac{1}{9}\,be^2x^9\log\left(cx^n\right)+\frac{1}{9}\,ae^2x^9-\frac{2}{49}\,bdenx^7+\frac{2}{7}\,bdex^7\log\left(cx^n\right)+\frac{2}{7}\,adex^7-\frac{1}{25}\,bd^2nx^5+\frac{1}{5}\,bd^2x^5\log\left(cx^n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/81*b*e^2*n*x^9 + 1/9*b*e^2*x^9*log(c*x^n) + 1/9*a*e^2*x^9 - 2/49*b*d*e*n
*x^7 + 2/7*b*d*e*x^7*log(c*x^n) + 2/7*a*d*e*x^7 - 1/25*b*d^2*n*x^5 + 1/5*b*
d^2*x^5*log(c*x^n) + 1/5*a*d^2*x^5
```

mupad [B] time = 3.69, size = 82, normalized size = 1.11

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^2\,x^5}{5}+\frac{2\,b\,d\,e\,x^7}{7}+\frac{b\,e^2\,x^9}{9}\right)+\frac{d^2\,x^5\,\left(5\,a-b\,n\right)}{25}+\frac{e^2\,x^9\,\left(9\,a-b\,n\right)}{81}+\frac{2\,d\,e\,x^7\,\left(7\,a-b\,n\right)}{49}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d + e*x^2)^2*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d^2*x^5)/5 + (b*e^2*x^9)/9 + (2*b*d*e*x^7)/7) + (d^2*x^5*(5*
a - b*n))/25 + (e^2*x^9*(9*a - b*n))/81 + (2*d*e*x^7*(7*a - b*n))/49
```

sympy [B] time = 14.50, size = 158, normalized size = 2.14

$$\frac{ad^2x^5}{5}+\frac{2adex^7}{7}+\frac{ae^2x^9}{9}+\frac{bd^2nx^5\log(x)}{5}-\frac{bd^2nx^5}{25}+\frac{bd^2x^5\log(c)}{5}+\frac{2bdenx^7\log(x)}{7}-\frac{2bdenx^7}{49}+\frac{2bdex^7\log(c)}{7}+be^2n$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**5/5 + 2*a*d*e*x**7/7 + a*e**2*x**9/9 + b*d**2*n*x**5*log(x)/5 - b
*d**2*n*x**5/25 + b*d**2*x**5*log(c)/5 + 2*b*d*e*n*x**7*log(x)/7 - 2*b*d*e*
n*x**7/49 + 2*b*d*e*x**7*log(c)/7 + b*e**2*n*x**9*log(x)/9 - b*e**2*n*x**9/
81 + b*e**2*x**9*log(c)/9
```

3.190 $\int x^2 \left(d+e x^2\right)^2 \left(a+b \log \left(c x^n\right)\right) \, dx$

Optimal. Leaf size=74

$$\frac{1}{105} \left(35 d^2 x^3+42 d e x^5+15 e^2 x^7\right) \left(a+b \log \left(c x^n\right)\right)-\frac{1}{9} b d^2 n x^3-\frac{2}{25} b d e n x^5-\frac{1}{49} b e^2 n x^7$$

```
[Out] -1/9*b*d^2*n*x^3-2/25*b*d*e*n*x^5-1/49*b*e^2*n*x^7+1/105*(15*e^2*x^7+42*d*e
*x^5+35*d^2*x^3)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.07, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$\frac{1}{105} \left(35 d^2 x^3+42 d e x^5+15 e^2 x^7\right) \left(a+b \log \left(c x^n\right)\right)-\frac{1}{9} b d^2 n x^3-\frac{2}{25} b d e n x^5-\frac{1}{49} b e^2 n x^7$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^3)/9 - (2*b*d*e*n*x^5)/25 - (b*e^2*n*x^7)/49 + ((35*d^2*x^3 + 4
2*d*e*x^5 + 15*e^2*x^7)*(a + b*Log[c*x^n]))/105
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned} \int x^2 \left(d+e x^2\right)^2 \left(a+b \log \left(c x^n\right)\right) \, dx &= \frac{1}{105} \left(35 d^2 x^3+42 d e x^5+15 e^2 x^7\right) \left(a+b \log \left(c x^n\right)\right)-(b n) \int \left(\frac{d^2 x^2}{3}+\frac{2}{5} \right. \\ &= -\frac{1}{9} b d^2 n x^3-\frac{2}{25} b d e n x^5-\frac{1}{49} b e^2 n x^7+\frac{1}{105} \left(35 d^2 x^3+42 d e x^5+15 e^2 x^7\right) \end{aligned}$$

Mathematica [A] time = 0.03, size = 95, normalized size = 1.28

$$\frac{1}{3} d^2 x^3 \left(a+b \log \left(c x^n\right)\right)+\frac{2}{5} d e x^5 \left(a+b \log \left(c x^n\right)\right)+\frac{1}{7} e^2 x^7 \left(a+b \log \left(c x^n\right)\right)-\frac{1}{9} b d^2 n x^3-\frac{2}{25} b d e n x^5-\frac{1}{49} b e^2 n x^7$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -1/9*(b*d^2*n*x^3) - (2*b*d*e*n*x^5)/25 - (b*e^2*n*x^7)/49 + (d^2*x^3*(a +
b*Log[c*x^n]))/3 + (2*d*e*x^5*(a + b*Log[c*x^n]))/5 + (e^2*x^7*(a + b*Log[c
*x^n]))/7
```

fricas [A] time = 0.64, size = 118, normalized size = 1.59

$$-\frac{1}{49}\left(be^2n-7\,ae^2\right)x^7-\frac{2}{25}\left(bden-5\,ade\right)x^5-\frac{1}{9}\left(bd^2n-3\,ad^2\right)x^3+\frac{1}{105}\left(15\,be^2x^7+42\,bdex^5+35\,bd^2x^3\right)\log(c)+\frac{1}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/49*(b*e^2*n - 7*a*e^2)*x^7 - 2/25*(b*d*e*n - 5*a*d*e)*x^5 - 1/9*(b*d^2*n
 - 3*a*d^2)*x^3 + 1/105*(15*b*e^2*x^7 + 42*b*d*e*x^5 + 35*b*d^2*x^3)*log(c)
 + 1/105*(15*b*e^2*n*x^7 + 42*b*d*e*n*x^5 + 35*b*d^2*n*x^3)*log(x)
```

giac [A] time = 0.28, size = 123, normalized size = 1.66

$$\frac{1}{7}\,bnx^7e^2\log(x)-\frac{1}{49}\,bnx^7e^2+\frac{1}{7}\,bx^7e^2\log(c)+\frac{2}{5}\,bdnx^5e\log(x)+\frac{1}{7}\,ax^7e^2-\frac{2}{25}\,bdnx^5e+\frac{2}{5}\,bdx^5e\log(c)+\frac{2}{5}\,adx^5e+\frac{1}{3}\,b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/7*b*n*x^7*e^2*log(x) - 1/49*b*n*x^7*e^2 + 1/7*b*x^7*e^2*log(c) + 2/5*b*d*
n*x^5*e*log(x) + 1/7*a*x^7*e^2 - 2/25*b*d*n*x^5*e + 2/5*b*d*x^5*e*log(c) +
2/5*a*d*x^5*e + 1/3*b*d^2*n*x^3*log(x) - 1/9*b*d^2*n*x^3 + 1/3*b*d^2*x^3*lo
g(c) + 1/3*a*d^2*x^3
```

maple [C] time = 0.22, size = 434, normalized size = 5.86

$$-\frac{i\pi b\,e^2x^7\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{14}+\frac{i\pi b\,e^2x^7\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{14}+\frac{i\pi b\,e^2x^7\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{14}-\frac{i\pi b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/105*b*x^3*(15*e^2*x^4+42*d*e*x^2+35*d^2)*ln(x^n)+1/6*I*Pi*b*d^2*x^3*csgn(
I*x^n)*csgn(I*c*x^n)^2-1/6*I*Pi*b*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)+1/14*I*Pi*b*e^2*x^7*csgn(I*x^n)*csgn(I*c*x^n)^2-1/6*I*Pi*b*d^2*x^3*csgn(
I*c*x^n)^3+1/7*ln(c)*b*e^2*x^7-1/49*b*e^2*n*x^7+1/7*a*e^2*x^7-1/14*I*Pi*b*e
^2*x^7*csgn(I*c*x^n)^3+1/5*I*Pi*b*d*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2-1/5*I
*Pi*b*d*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/5*I*Pi*b*d*e*x^5*csgn(I
*c*x^n)^2*csgn(I*c)+2/5*b*d*e*x^5*ln(c)-2/25*b*d*e*n*x^5+2/5*a*d*e*x^5-1/5*
I*Pi*b*d*e*x^5*csgn(I*c*x^n)^3-1/14*I*Pi*b*e^2*x^7*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)+1/14*I*Pi*b*e^2*x^7*csgn(I*c*x^n)^2*csgn(I*c)+1/6*I*Pi*b*d^2*x^
3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*b*d^2*x^3*ln(c)-1/9*b*d^2*n*x^3+1/3*a*d^2*x
^3
```

maxima [A] time = 0.51, size = 100, normalized size = 1.35

$$-\frac{1}{49}\,be^2nx^7+\frac{1}{7}\,be^2x^7\log\left(cx^n\right)+\frac{1}{7}\,ae^2x^7-\frac{2}{25}\,bdenx^5+\frac{2}{5}\,bdex^5\log\left(cx^n\right)+\frac{2}{5}\,adex^5-\frac{1}{9}\,bd^2nx^3+\frac{1}{3}\,bd^2x^3\log\left(cx^n\right)+\frac{1}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/49*b*e^2*n*x^7 + 1/7*b*e^2*x^7*log(c*x^n) + 1/7*a*e^2*x^7 - 2/25*b*d*e*n
*x^5 + 2/5*b*d*e*x^5*log(c*x^n) + 2/5*a*d*e*x^5 - 1/9*b*d^2*n*x^3 + 1/3*b*d
^2*x^3*log(c*x^n) + 1/3*a*d^2*x^3
```

mupad [B] time = 3.59, size = 82, normalized size = 1.11

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^2\,x^3}{3}+\frac{2\,b\,d\,e\,x^5}{5}+\frac{b\,e^2\,x^7}{7}\right)+\frac{d^2\,x^3\,\left(3\,a-b\,n\right)}{9}+\frac{e^2\,x^7\,\left(7\,a-b\,n\right)}{49}+\frac{2\,d\,e\,x^5\,\left(5\,a-b\,n\right)}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d + e*x^2)^2*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d^2*x^3)/3 + (b*e^2*x^7)/7 + (2*b*d*e*x^5)/5) + (d^2*x^3*(3*
a - b*n))/9 + (e^2*x^7*(7*a - b*n))/49 + (2*d*e*x^5*(5*a - b*n))/25
```

sympy [B] time = 6.18, size = 158, normalized size = 2.14

$$\frac{ad^2x^3}{3}+\frac{2adex^5}{5}+\frac{ae^2x^7}{7}+\frac{bd^2nx^3\log(x)}{3}-\frac{bd^2nx^3}{9}+\frac{bd^2x^3\log(c)}{3}+\frac{2bdenx^5\log(x)}{5}-\frac{2bdenx^5}{25}+\frac{2bdex^5\log(c)}{5}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**3/3 + 2*a*d*e*x**5/5 + a*e**2*x**7/7 + b*d**2*n*x**3*log(x)/3 - b
*d**2*n*x**3/9 + b*d**2*x**3*log(c)/3 + 2*b*d*e*n*x**5*log(x)/5 - 2*b*d*e*n
*x**5/25 + 2*b*d*e*x**5*log(c)/5 + b*e**2*n*x**7*log(x)/7 - b*e**2*n*x**7/4
9 + b*e**2*x**7*log(c)/7
```

3.191 $\int \left(d+ex^2\right)^2 \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=86

$$d^2x\left(a+b\log\left(cx^n\right)\right)+\frac{2}{3}dex^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{5}e^2x^5\left(a+b\log\left(cx^n\right)\right)-bd^2nx-\frac{2}{9}bdenx^3-\frac{1}{25}be^2nx^5$$

```
[Out] -b*d^2*n*x-2/9*b*d*e*n*x^3-1/25*b*e^2*n*x^5+d^2*x*(a+b*ln(c*x^n))+2/3*d*e*x
^3*(a+b*ln(c*x^n))+1/5*e^2*x^5*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.04, antiderivative size = 68, normalized size of antiderivative = 0.79, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {194, 2313}

$$\frac{1}{15}\left(15d^2x+10dex^3+3e^2x^5\right)\left(a+b\log\left(cx^n\right)\right)-bd^2nx-\frac{2}{9}bdenx^3-\frac{1}{25}be^2nx^5$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x) - (2*b*d*e*n*x^3)/9 - (b*e^2*n*x^5)/25 + ((15*d^2*x + 10*d*e*x
^3 + 3*e^2*x^5)*(a + b*Log[c*x^n]))/15
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\begin{aligned}\int \left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{15}\left(15d^2x+10dex^3+3e^2x^5\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(d^2+\frac{2}{3}dex^2+\frac{e^2x^4}{5}\right.\\ &= -bd^2nx-\frac{2}{9}bdenx^3-\frac{1}{25}be^2nx^5+\frac{1}{15}\left(15d^2x+10dex^3+3e^2x^5\right)\left(a+b\log\left(c\right.\right.\end{aligned}$$

Mathematica [A] time = 0.03, size = 89, normalized size = 1.03

$$\frac{2}{3}dex^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{5}e^2x^5\left(a+b\log\left(cx^n\right)\right)+ad^2x+bd^2x\log\left(cx^n\right)-bd^2nx-\frac{2}{9}bdenx^3-\frac{1}{25}be^2nx^5$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] a*d^2*x - b*d^2*n*x - (2*b*d*e*n*x^3)/9 - (b*e^2*n*x^5)/25 + b*d^2*x*Log[c*
x^n] + (2*d*e*x^3*(a + b*Log[c*x^n]))/3 + (e^2*x^5*(a + b*Log[c*x^n]))/5
```

fricas [A] time = 0.44, size = 112, normalized size = 1.30

$$-\frac{1}{25}\left(be^2n-5\,ae^2\right)x^5-\frac{2}{9}\left(bden-3\,ade\right)x^3-\left(bd^2n-ad^2\right)x+\frac{1}{15}\left(3\,be^2x^5+10\,bdex^3+15\,bd^2x\right)\log(c)+\frac{1}{15}\left(3\,be^2nx^5\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/25*(b*e^2*n - 5*a*e^2)*x^5 - 2/9*(b*d*e*n - 3*a*d*e)*x^3 - (b*d^2*n - a*
d^2)*x + 1/15*(3*b*e^2*x^5 + 10*b*d*e*x^3 + 15*b*d^2*x)*log(c) + 1/15*(3*b*
e^2*n*x^5 + 10*b*d*e*n*x^3 + 15*b*d^2*n*x)*log(x)
```

giac [A] time = 0.41, size = 112, normalized size = 1.30

$$\frac{1}{5}\,bnx^5e^2\log(x)-\frac{1}{25}\,bnx^5e^2+\frac{1}{5}\,bx^5e^2\log(c)+\frac{2}{3}\,bdnx^3e\log(x)+\frac{1}{5}\,ax^5e^2-\frac{2}{9}\,bdnx^3e+\frac{2}{3}\,bdx^3e\log(c)+\frac{2}{3}\,adx^3e+bd$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/5*b*n*x^5*e^2*log(x) - 1/25*b*n*x^5*e^2 + 1/5*b*x^5*e^2*log(c) + 2/3*b*d*
n*x^3*e*log(x) + 1/5*a*x^5*e^2 - 2/9*b*d*n*x^3*e + 2/3*b*d*x^3*e*log(c) + 2
/3*a*d*x^3*e + b*d^2*n*x*log(x) - b*d^2*n*x + b*d^2*x*log(c) + a*d^2*x
```

maple [C] time = 0.22, size = 416, normalized size = 4.84

$$-\frac{i\pi b\,e^2x^5\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)}{10}+\frac{i\pi b\,e^2x^5\mathrm{csgn}\,(ic)\,\mathrm{csgn}\,(ic\,x^n)^2}{10}+\frac{i\pi b\,e^2x^5\mathrm{csgn}\,(ix^n)\,\mathrm{csgn}\,(ic\,x^n)^2}{10}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/15*b*x*(3*e^2*x^4+10*d*e*x^2+15*d^2)*ln(x^n)-1/3*I*Pi*b*d*e*x^3*csgn(I*c*
x^n)^3+1/3*I*Pi*b*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I*Pi*b*d*e*x^3*cs
gn(I*c*x^n)^2*csgn(I*c)+1/10*I*Pi*b*e^2*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/10*
I*Pi*b*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*Pi*b*d^2*csgn(I*c*x^n)^3*x
-1/3*I*Pi*b*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/10*I*Pi*b*e^2*x^5
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^
n)^2*x-1/2*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+1/2*I*Pi*b*d^2*
csgn(I*c*x^n)^2*csgn(I*c)*x-1/10*I*Pi*b*e^2*x^5*csgn(I*c*x^n)^3+1/5*b*e^2*x
^5*ln(c)-1/25*b*e^2*n*x^5+1/5*a*e^2*x^5+2/3*b*d*e*x^3*ln(c)-2/9*b*d*e*n*x^3
+2/3*a*d*e*x^3+ln(c)*b*d^2*x-b*d^2*n*x+a*d^2*x
```

maxima [A] time = 0.47, size = 92, normalized size = 1.07

$$-\frac{1}{25}\,be^2nx^5+\frac{1}{5}\,be^2x^5\log\left(cx^n\right)+\frac{1}{5}\,ae^2x^5-\frac{2}{9}\,bdenx^3+\frac{2}{3}\,bdex^3\log\left(cx^n\right)+\frac{2}{3}\,adex^3-bd^2nx+bd^2x\log\left(cx^n\right)+ad^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/25*b*e^2*n*x^5 + 1/5*b*e^2*x^5*log(c*x^n) + 1/5*a*e^2*x^5 - 2/9*b*d*e*n*
x^3 + 2/3*b*d*e*x^3*log(c*x^n) + 2/3*a*d*e*x^3 - b*d^2*n*x + b*d^2*x*log(c*
x^n) + a*d^2*x
```

mupad [B] time = 3.44, size = 74, normalized size = 0.86

$$\ln\left(c\,x^n\right)\,\left(b\,d^2\,x+\frac{2\,b\,d\,e\,x^3}{3}+\frac{b\,e^2\,x^5}{5}\right)+\frac{e^2\,x^5\,\left(5\,a-b\,n\right)}{25}+d^2\,x\,\left(a-b\,n\right)+\frac{2\,d\,e\,x^3\,\left(3\,a-b\,n\right)}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)^2*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*e^2*x^5)/5 + b*d^2*x + (2*b*d*e*x^3)/3) + (e^2*x^5*(5*a - b*
n))/25 + d^2*x*(a - b*n) + (2*d*e*x^3*(3*a - b*n))/9
```

sympy [A] time = 2.53, size = 144, normalized size = 1.67

$$ad^2x+\frac{2adex^3}{3}+\frac{ae^2x^5}{5}+bd^2nx\log(x)-bd^2nx+bd^2x\log(c)+\frac{2bdenx^3\log(x)}{3}-\frac{2bdenx^3}{9}+\frac{2bdex^3\log(c)}{3}+\frac{be^2nx^5\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x + 2*a*d*e*x**3/3 + a*e**2*x**5/5 + b*d**2*n*x*log(x) - b*d**2*n*x
+ b*d**2*x*log(c) + 2*b*d*e*n*x**3*log(x)/3 - 2*b*d*e*n*x**3/9 + 2*b*d*e*x*
*3*log(c)/3 + b*e**2*n*x**5*log(x)/5 - b*e**2*n*x**5/25 + b*e**2*x**5*log(c
)/5
```

3.192 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=83

$$-\frac{d^2(a+b\log(cx^n))}{x}+2dex(a+b\log(cx^n))+\frac{1}{3}e^2x^3(a+b\log(cx^n))-\frac{bd^2n}{x}-2bdenx-\frac{1}{9}be^2nx^3$$

```
[Out] -b*d^2*n/x-2*b*d*e*n*x-1/9*b*e^2*n*x^3-d^2*(a+b*ln(c*x^n))/x+2*d*e*x*(a+b*l
n(c*x^n))+1/3*e^2*x^3*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.07, antiderivative size = 66, normalized size of antiderivative = 0.80, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$-\frac{1}{3}\left(\frac{3d^2}{x}-6dex-e^2x^3\right)(a+b\log(cx^n))-\frac{bd^2n}{x}-2bdenx-\frac{1}{9}be^2nx^3$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^2*n)/x) - 2*b*d*e*n*x - (b*e^2*n*x^3)/9 - (((3*d^2)/x - 6*d*e*x - e^
2*x^3)*(a + b*Log[c*x^n]))/3
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^2}\,dx &= -\frac{1}{3}\left(\frac{3d^2}{x}-6dex-e^2x^3\right)(a+b\log(cx^n))-(bn)\int\left(2de-\frac{d^2}{x^2}+\frac{e^2x^2}{3}\right)dx\\ &= -\frac{bd^2n}{x}-2bdenx-\frac{1}{9}be^2nx^3-\frac{1}{3}\left(\frac{3d^2}{x}-6dex-e^2x^3\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.04, size = 86, normalized size = 1.04

$$-\frac{d^2(a+b\log(cx^n))}{x}+\frac{1}{3}e^2x^3(a+b\log(cx^n))+2adex+2bdex\log(cx^n)-\frac{bd^2n}{x}-2bdenx-\frac{1}{9}be^2nx^3$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^2*n)/x) + 2*a*d*e*x - 2*b*d*e*n*x - (b*e^2*n*x^3)/9 + 2*b*d*e*x*Log[
c*x^n] - (d^2*(a + b*Log[c*x^n]))/x + (e^2*x^3*(a + b*Log[c*x^n]))/3
```

fricas [A] time = 0.48, size = 109, normalized size = 1.31

$$-\frac{\left(be^2n-3\,ae^2\right)x^4+9\,bd^2n+9\,ad^2+18\,(bden-ade)x^2-3\left(be^2x^4+6\,bdex^2-3\,bd^2\right)\log(c)-3\left(be^2nx^4+6\,bden\right.}{9\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -1/9*((b*e^2*n - 3*a*e^2)*x^4 + 9*b*d^2*n + 9*a*d^2 + 18*(b*d*e*n - a*d*e)*
x^2 - 3*(b*e^2*x^4 + 6*b*d*e*x^2 - 3*b*d^2)*log(c) - 3*(b*e^2*n*x^4 + 6*b*d
*e*n*x^2 - 3*b*d^2*n)*log(x))/x
```

giac [A] time = 0.31, size = 116, normalized size = 1.40

$$\frac{3\,bnx^4e^2\log(x)-bnx^4e^2+3\,bx^4e^2\log(c)+18\,bdnx^2e\log(x)+3\,ax^4e^2-18\,bdnx^2e+18\,bdx^2e\log(c)+18\,adx^2e}{9\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] 1/9*(3*b*n*x^4*e^2*log(x) - b*n*x^4*e^2 + 3*b*x^4*e^2*log(c) + 18*b*d*n*x^2
*e*log(x) + 3*a*x^4*e^2 - 18*b*d*n*x^2*e + 18*b*d*x^2*e*log(c) + 18*a*d*x^2
*e - 9*b*d^2*n*log(x) - 9*b*d^2*n - 9*b*d^2*log(c) - 9*a*d^2)/x
```

maple [C] time = 0.21, size = 419, normalized size = 5.05

$$-\frac{\left(-e^2x^4-6de\,x^2+3d^2\right)b\ln\left(x^n\right)}{3x}-\frac{3i\pi b\,e^2x^4\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)-3i\pi b\,e^2x^4\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2-}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(b*ln(c*x^n)+a)/x^2,x)
```

```
[Out] -1/3*b*(-e^2*x^4-6*d*e*x^2+3*d^2)/x*ln(x^n)-1/18*(18*I*Pi*b*d*e*x^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+3*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3-18*I*Pi*b*d*e
*x^2*csgn(I*c*x^n)^2*csgn(I*c)+18*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^3-3*I*Pi*b*e
^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*
c)+9*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-9*I*Pi*b*d^2*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)+3*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+9*I*
Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-18*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x
^n)^2-9*I*Pi*b*d^2*csgn(I*c*x^n)^3-6*b*e^2*x^4*ln(c)+2*b*e^2*n*x^4-6*a*e^2*
x^4-36*b*d*e*x^2*ln(c)+36*b*d*e*n*x^2-36*a*d*e*x^2+18*b*d^2*ln(c)+18*b*d^2*
n+18*a*d^2)/x
```

maxima [A] time = 0.49, size = 94, normalized size = 1.13

$$-\frac{1}{9}\,be^2nx^3+\frac{1}{3}\,be^2x^3\log\left(cx^n\right)+\frac{1}{3}\,ae^2x^3-2\,bdenx+2\,bdex\log\left(cx^n\right)+2\,adex-\frac{bd^2n}{x}-\frac{bd^2\log\left(cx^n\right)}{x}-\frac{ad^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^2*n*x^3 + 1/3*b*e^2*x^3*log(c*x^n) + 1/3*a*e^2*x^3 - 2*b*d*e*n*x +
 2*b*d*e*x*log(c*x^n) + 2*a*d*e*x - b*d^2*n/x - b*d^2*log(c*x^n)/x - a*d^2/
x
```

mupad [B] time = 3.46, size = 102, normalized size = 1.23

$$\ln\left(c\,x^n\right)\left(\frac{\frac{4\,b\,e^2\,x^4}{3}+4\,b\,d\,e\,x^2}{x}-\frac{b\,d^2+2\,b\,d\,e\,x^2+b\,e^2\,x^4}{x}\right)-\frac{a\,d^2+b\,d^2\,n}{x}+\frac{e^2\,x^3\,\left(3\,a-b\,n\right)}{9}+2\,d\,e\,x\,\left(a-b\,n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^2*(a + b*log(c*x^n)))/x^2,x)
```

```
[Out] log(c*x^n)*(((4*b*e^2*x^4)/3 + 4*b*d*e*x^2)/x - (b*d^2 + b*e^2*x^4 + 2*b*d*
e*x^2)/x) - (a*d^2 + b*d^2*n)/x + (e^2*x^3*(3*a - b*n))/9 + 2*d*e*x*(a - b*
n)
```

sympy [A] time = 2.62, size = 131, normalized size = 1.58

$$-\frac{ad^2}{x}+2adex+\frac{ae^2x^3}{3}-\frac{bd^2n\log(x)}{x}-\frac{bd^2n}{x}-\frac{bd^2\log(c)}{x}+2bdenx\log(x)-2bdenx+2bdex\log(c)+\frac{be^2nx^3\log(x)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] -a*d**2/x + 2*a*d*e*x + a*e**2*x**3/3 - b*d**2*n*log(x)/x - b*d**2*n/x - b*
d**2*log(c)/x + 2*b*d*e*n*x*log(x) - 2*b*d*e*n*x + 2*b*d*e*x*log(c) + b*e**
2*n*x**3*log(x)/3 - b*e**2*n*x**3/9 + b*e**2*x**3*log(c)/3
```

3.193 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=82

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{2de\left(a+b\log\left(cx^n\right)\right)}{x}+e^2x\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{9x^3}-\frac{2bden}{x}-be^2nx$$

```
[Out] -1/9*b*d^2*n/x^3-2*b*d*e*n/x-b*e^2*n*x-1/3*d^2*(a+b*ln(c*x^n))/x^3-2*d*e*(a
+b*ln(c*x^n))/x+e^2*x*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.07, antiderivative size = 65, normalized size of antiderivative = 0.79, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$-\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6de}{x}-3e^2x\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{9x^3}-\frac{2bden}{x}-be^2nx$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^2*n)/(9*x^3) - (2*b*d*e*n)/x - b*e^2*n*x - ((d^2/x^3 + (6*d*e)/x - 3*
e^2*x)*(a + b*Log[c*x^n]))/3
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] && !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int\frac{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)}{x^4}\,dx&=-\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6de}{x}-3e^2x\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(e^2-\frac{d^2}{3x^4}-\frac{2de}{x^2}\right)dx\\&=-\frac{bd^2n}{9x^3}-\frac{2bden}{x}-be^2nx-\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6de}{x}-3e^2x\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.04, size = 80, normalized size = 0.98

$$-\frac{3a\left(d^2+6dex^2-3e^2x^4\right)+3b\left(d^2+6dex^2-3e^2x^4\right)\log\left(cx^n\right)+bn\left(d^2+18dex^2+9e^2x^4\right)}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -1/9*(3*a*(d^2 + 6*d*e*x^2 - 3*e^2*x^4) + b*n*(d^2 + 18*d*e*x^2 + 9*e^2*x^4
) + 3*b*(d^2 + 6*d*e*x^2 - 3*e^2*x^4)*Log[c*x^n])/x^3
```

fricas [A] time = 0.63, size = 110, normalized size = 1.34

$$-\frac{9\left(be^2n-ae^2\right)x^4+bd^2n+3\,ad^2+18\,(bden+ade)x^2-3\left(3\,be^2x^4-6\,bdex^2-bd^2\right)\log(c)-3\left(3\,be^2nx^4-6\,bd\right.}{9\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(9*(b*e^2*n - a*e^2)*x^4 + b*d^2*n + 3*a*d^2 + 18*(b*d*e*n + a*d*e)*x^
2 - 3*(3*b*e^2*x^4 - 6*b*d*e*x^2 - b*d^2)*log(c) - 3*(3*b*e^2*n*x^4 - 6*b*d
*e*n*x^2 - b*d^2*n)*log(x))/x^3
```

giac [A] time = 0.28, size = 116, normalized size = 1.41

$$\frac{9\,bnx^4e^2\log(x)-9\,bnx^4e^2+9\,bx^4e^2\log(c)-18\,bdnx^2e\log(x)+9\,ax^4e^2-18\,bdnx^2e-18\,bdx^2e\log(c)-18\,ad}{9\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] 1/9*(9*b*n*x^4*e^2*log(x) - 9*b*n*x^4*e^2 + 9*b*x^4*e^2*log(c) - 18*b*d*n*x
^2*e*log(x) + 9*a*x^4*e^2 - 18*b*d*n*x^2*e - 18*b*d*x^2*e*log(c) - 18*a*d*x
^2*e - 3*b*d^2*n*log(x) - b*d^2*n - 3*b*d^2*log(c) - 3*a*d^2)/x^3
```

maple [C] time = 0.23, size = 417, normalized size = 5.09

$$-\frac{\left(-3e^2x^4+6de\,x^2+d^2\right)b\ln\left(x^n\right)}{3x^3}-\frac{9i\pi b\,e^2x^4\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)-9i\pi b\,e^2x^4\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(b*ln(c*x^n)+a)/x^4,x)
```

```
[Out] -1/3*b*(-3*e^2*x^4+6*d*e*x^2+d^2)/x^3*ln(x^n)-1/18*(18*I*Pi*b*d*e*x^2*csgn(
I*x^n)*csgn(I*c*x^n)^2+9*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3+9*I*Pi*b*e^2*x^4*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b*d^2*csgn(I*c*x^n)^3-9*I*Pi*b*e^2
*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+18*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c
)-3*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*I*Pi*b*d*e*x^2*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*b*e^2*x^4*ln(c)-9*I*Pi*b*e^2*x^4*csgn(I*c*
x^n)^2*csgn(I*c)+3*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-18*I*Pi*b*d*e*x^2*c
sgn(I*c*x^n)^3+3*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+18*b*e^2*n*x^4-18*a
*e^2*x^4+36*b*d*e*x^2*ln(c)+36*b*d*e*n*x^2+36*a*d*e*x^2+6*b*d^2*ln(c)+2*b*d
^2*n+6*a*d^2)/x^3
```

maxima [A] time = 0.47, size = 92, normalized size = 1.12

$$-be^2nx+be^2x\log\left(cx^n\right)+ae^2x-\frac{2\,bden}{x}-\frac{2\,bde\log\left(cx^n\right)}{x}-\frac{2\,ade}{x}-\frac{bd^2n}{9\,x^3}-\frac{bd^2\log\left(cx^n\right)}{3\,x^3}-\frac{ad^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] -b*e^2*n*x + b*e^2*x*log(c*x^n) + a*e^2*x - 2*b*d*e*n/x - 2*b*d*e*log(c*x^n
)/x - 2*a*d*e/x - 1/9*b*d^2*n/x^3 - 1/3*b*d^2*log(c*x^n)/x^3 - 1/3*a*d^2/x^
3
```

mupad [B] time = 3.48, size = 90, normalized size = 1.10

$$e^2\,x\,\left(a-b\,n\right)-\frac{x^2\,\left(6\,a\,d\,e+6\,b\,d\,e\,n\right)+a\,d^2+\frac{b\,d^2\,n}{3}}{3\,x^3}-\ln\left(c\,x^n\right)\,\left(\frac{\frac{b\,d^2}{3}+2\,b\,d\,e\,x^2+\frac{5\,b\,e^2\,x^4}{3}}{x^3}-\frac{8\,b\,e^2\,x}{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^2*(a + b*log(c*x^n)))/x^4,x)
```

```
[Out] e^2*x*(a - b*n) - (x^2*(6*a*d*e + 6*b*d*e*n) + a*d^2 + (b*d^2*n)/3)/(3*x^3)
 - log(c*x^n)*(((b*d^2)/3 + (5*b*e^2*x^4)/3 + 2*b*d*e*x^2)/x^3 - (8*b*e^2*x
)/3)
```

sympy [A] time = 2.76, size = 131, normalized size = 1.60

$$-\frac{ad^2}{3x^3}-\frac{2ade}{x}+ae^2x-\frac{bd^2n\log(x)}{3x^3}-\frac{bd^2n}{9x^3}-\frac{bd^2\log(c)}{3x^3}-\frac{2bden\log(x)}{x}-\frac{2bden}{x}-\frac{2bde\log(c)}{x}+be^2nx\log(x)-be^2nx+b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d**2/(3*x**3) - 2*a*d*e/x + a*e**2*x - b*d**2*n*log(x)/(3*x**3) - b*d**2
*n/(9*x**3) - b*d**2*log(c)/(3*x**3) - 2*b*d*e*n*log(x)/x - 2*b*d*e*n/x - 2
*b*d*e*log(c)/x + b*e**2*n*x*log(x) - b*e**2*n*x + b*e**2*x*log(c)
```

3.194 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=91

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{2de\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{bd^2n}{25x^5}-\frac{2bden}{9x^3}-\frac{be^2n}{x}$$

```
[Out] -1/25*b*d^2*n/x^5-2/9*b*d*e*n/x^3-b*e^2*n/x-1/5*d^2*(a+b*ln(c*x^n))/x^5-2/3
*d*e*(a+b*ln(c*x^n))/x^3-e^2*(a+b*ln(c*x^n))/x
```

Rubi [A] time = 0.08, antiderivative size = 72, normalized size of antiderivative = 0.79, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{15}\left(\frac{3d^2}{x^5}+\frac{10de}{x^3}+\frac{15e^2}{x}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{25x^5}-\frac{2bden}{9x^3}-\frac{be^2n}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d^2*n)/(25*x^5) - (2*b*d*e*n)/(9*x^3) - (b*e^2*n)/x - (((3*d^2)/x^5 + (
10*d*e)/x^3 + (15*e^2)/x)*(a + b*Log[c*x^n]))/15
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^6}dx = -\frac{1}{15}\left(\frac{3d^2}{x^5}+\frac{10de}{x^3}+\frac{15e^2}{x}\right)(a+b\log(cx^n)) - (bn)\int \frac{-3d^2-10dex^2-15e^2x}{15x^6}$$
$$= -\frac{1}{15}\left(\frac{3d^2}{x^5}+\frac{10de}{x^3}+\frac{15e^2}{x}\right)(a+b\log(cx^n)) - \frac{1}{15}(bn)\int \frac{-3d^2-10dex^2-15e}{x^6}$$
$$= -\frac{1}{15}\left(\frac{3d^2}{x^5}+\frac{10de}{x^3}+\frac{15e^2}{x}\right)(a+b\log(cx^n)) - \frac{1}{15}(bn)\int \left(-\frac{3d^2}{x^6}-\frac{10de}{x^4}-\frac{15e}{x^2}\right.$$
$$= -\frac{bd^2n}{25x^5}-\frac{2bden}{9x^3}-\frac{be^2n}{x}-\frac{1}{15}\left(\frac{3d^2}{x^5}+\frac{10de}{x^3}+\frac{15e^2}{x}\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.04, size = 86, normalized size = 0.95

$$-\frac{15a(3d^2+10dex^2+15e^2x^4)+15b(3d^2+10dex^2+15e^2x^4)\log(cx^n)+bn(9d^2+50dex^2+225e^2x^4)}{225x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -1/225*(15*a*(3*d^2 + 10*d*e*x^2 + 15*e^2*x^4) + b*n*(9*d^2 + 50*d*e*x^2 +
225*e^2*x^4) + 15*b*(3*d^2 + 10*d*e*x^2 + 15*e^2*x^4)*Log[c*x^n])/x^5
```

fricas [A] time = 0.90, size = 111, normalized size = 1.22

$$-\frac{225(be^2n+ae^2)x^4+9bd^2n+45ad^2+50(bden+3ade)x^2+15(15be^2x^4+10bdex^2+3bd^2)\log(c)+15(15b}{225x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/225*(225*(b*e^2*n + a*e^2)*x^4 + 9*b*d^2*n + 45*a*d^2 + 50*(b*d*e*n + 3*
a*d*e)*x^2 + 15*(15*b*e^2*x^4 + 10*b*d*e*x^2 + 3*b*d^2)*log(c) + 15*(15*b*e
^2*n*x^4 + 10*b*d*e*n*x^2 + 3*b*d^2*n)*log(x))/x^5
```

giac [A] time = 0.26, size = 116, normalized size = 1.27

$$-\frac{225bnx^4e^2\log(x)+225bnx^4e^2+225bx^4e^2\log(c)+150bdnx^2e\log(x)+225ax^4e^2+50bdnx^2e+150bdx^2e\log}{225x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] -1/225*(225*b*n*x^4*e^2*log(x) + 225*b*n*x^4*e^2 + 225*b*x^4*e^2*log(c) + 1
50*b*d*n*x^2*e*log(x) + 225*a*x^4*e^2 + 50*b*d*n*x^2*e + 150*b*d*x^2*e*log(
c) + 150*a*d*x^2*e + 45*b*d^2*n*log(x) + 9*b*d^2*n + 45*b*d^2*log(c) + 45*a
*d^2)/x^5
```

maple [C] time = 0.17, size = 419, normalized size = 4.60

$$-\frac{(15e^2x^4+10dex^2+3d^2)b\ln(x^n)}{15x^5}-\frac{-225i\pi be^2x^4\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)+225i\pi be^2x^4\mathrm{csgn}(ic)\,\mathrm{csgn}(i}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(b*ln(c*x^n)+a)/x^6,x)
```

```
[Out] -1/15*b*(15*e^2*x^4+10*d*e*x^2+3*d^2)/x^5*ln(x^n)-1/450*(-150*I*Pi*b*d*e*x^
2*csgn(I*c*x^n)^3+150*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+45*I*Pi*b*
d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-45*I*Pi*b*d^2*csgn(I*c*x^n)^3+450*b*e^2*x^4
*ln(c)+450*b*e^2*n*x^4+450*a*e^2*x^4-225*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)-45*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+225*I*Pi
*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-150*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)+300*b*d*e*x^2*ln(c)+100*b*d*e*n*x^2+300*a*d*e*x^2-225*I*Pi
*b*e^2*x^4*csgn(I*c*x^n)^3+150*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+225
*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+45*I*Pi*b*d^2*csgn(I*c*x^n)^2*c
sgn(I*c)+90*b*d^2*ln(c)+18*b*d^2*n+90*a*d^2)/x^5
```

maxima [A] time = 0.47, size = 100, normalized size = 1.10

$$-\frac{be^2n}{x}-\frac{be^2\log\left(cx^n\right)}{x}-\frac{ae^2}{x}-\frac{2\,bden}{9\,x^3}-\frac{2\,bde\log\left(cx^n\right)}{3\,x^3}-\frac{2\,ade}{3\,x^3}-\frac{bd^2n}{25\,x^5}-\frac{bd^2\log\left(cx^n\right)}{5\,x^5}-\frac{ad^2}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] -b*e^2*n/x - b*e^2*log(c*x^n)/x - a*e^2/x - 2/9*b*d*e*n/x^3 - 2/3*b*d*e*log
(c*x^n)/x^3 - 2/3*a*d*e/x^3 - 1/25*b*d^2*n/x^5 - 1/5*b*d^2*log(c*x^n)/x^5 -
 1/5*a*d^2/x^5
```

mupad [B] time = 3.51, size = 88, normalized size = 0.97

$$-\frac{x^4\,\left(15\,a\,e^2+15\,b\,e^2\,n\right)+x^2\,\left(10\,a\,d\,e+\frac{10\,b\,d\,e\,n}{3}\right)+3\,a\,d^2+\frac{3\,b\,d^2\,n}{5}}{15\,x^5}-\frac{\ln\left(c\,x^n\right)\,\left(\frac{b\,d^2}{5}+\frac{2\,b\,d\,e\,x^2}{3}+b\,e^2\,x^4\right)}{x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^2*(a + b*log(c*x^n)))/x^6,x)
```

```
[Out] - (x^4*(15*a*e^2 + 15*b*e^2*n) + x^2*(10*a*d*e + (10*b*d*e*n)/3) + 3*a*d^2
+ (3*b*d^2*n)/5)/(15*x^5) - (log(c*x^n)*((b*d^2)/5 + b*e^2*x^4 + (2*b*d*e*x
^2)/3))/x^5
```

sympy [A] time = 4.21, size = 146, normalized size = 1.60

$$-\frac{ad^2}{5x^5}-\frac{2ade}{3x^3}-\frac{ae^2}{x}-\frac{bd^2n\log\left(x\right)}{5x^5}-\frac{bd^2n}{25x^5}-\frac{bd^2\log\left(c\right)}{5x^5}-\frac{2bden\log\left(x\right)}{3x^3}-\frac{2bden}{9x^3}-\frac{2bde\log\left(c\right)}{3x^3}-\frac{be^2n\log\left(x\right)}{x}-\frac{be^2n}{x}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] -a*d**2/(5*x**5) - 2*a*d*e/(3*x**3) - a*e**2/x - b*d**2*n*log(x)/(5*x**5) -
 b*d**2*n/(25*x**5) - b*d**2*log(c)/(5*x**5) - 2*b*d*e*n*log(x)/(3*x**3) -
2*b*d*e*n/(9*x**3) - 2*b*d*e*log(c)/(3*x**3) - b*e**2*n*log(x)/x - b*e**2*n
/x - b*e**2*log(c)/x
```

3.195 $\int \frac{(d+ex^2)^2 (a+b\log(cx^n))}{x^8} dx$

Optimal. Leaf size=95

$$-\frac{d^2 \left(a + b\log \left(cx^n\right)\right)}{7x^7} - \frac{2de \left(a + b\log \left(cx^n\right)\right)}{5x^5} - \frac{e^2 \left(a + b\log \left(cx^n\right)\right)}{3x^3} - \frac{bd^2n}{49x^7} - \frac{2bden}{25x^5} - \frac{be^2n}{9x^3}$$

```
[Out] -1/49*b*d^2*n/x^7-2/25*b*d*e*n/x^5-1/9*b*e^2*n/x^3-1/7*d^2*(a+b*ln(c*x^n))/
x^7-2/5*d*e*(a+b*ln(c*x^n))/x^5-1/3*e^2*(a+b*ln(c*x^n))/x^3
```

Rubi [A] time = 0.08, antiderivative size = 74, normalized size of antiderivative = 0.78, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{105}\left(\frac{15d^2}{x^7} + \frac{42de}{x^5} + \frac{35e^2}{x^3}\right)\left(a + b\log \left(cx^n\right)\right) - \frac{bd^2n}{49x^7} - \frac{2bden}{25x^5} - \frac{be^2n}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^2*n)/(49*x^7) - (2*b*d*e*n)/(25*x^5) - (b*e^2*n)/(9*x^3) - (((15*d^2)
/x^7 + (42*d*e)/x^5 + (35*e^2)/x^3)*(a + b*Log[c*x^n]))/105
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^2)^2 (a+b\log(cx^n))}{x^8}\,dx = -\frac{1}{105}\left(\frac{15d^2}{x^7}+\frac{42de}{x^5}+\frac{35e^2}{x^3}\right)(a+b\log(cx^n)) - (bn)\int \frac{-15d^2-42dex^2-}{105x^8}$$
$$= -\frac{1}{105}\left(\frac{15d^2}{x^7}+\frac{42de}{x^5}+\frac{35e^2}{x^3}\right)(a+b\log(cx^n)) - \frac{1}{105}(bn)\int \frac{-15d^2-42d}{x}$$
$$= -\frac{1}{105}\left(\frac{15d^2}{x^7}+\frac{42de}{x^5}+\frac{35e^2}{x^3}\right)(a+b\log(cx^n)) - \frac{1}{105}(bn)\int\left(-\frac{15d^2}{x^8}-\frac{42}{x}\right.$$
$$= -\frac{bd^2n}{49x^7}-\frac{2bden}{25x^5}-\frac{be^2n}{9x^3}-\frac{1}{105}\left(\frac{15d^2}{x^7}+\frac{42de}{x^5}+\frac{35e^2}{x^3}\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.05, size = 95, normalized size = 1.00

$$-\frac{d^2(a+b\log(cx^n))}{7x^7}-\frac{2de(a+b\log(cx^n))}{5x^5}-\frac{e^2(a+b\log(cx^n))}{3x^3}-\frac{bd^2n}{49x^7}-\frac{2bden}{25x^5}-\frac{be^2n}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -1/49*(b*d^2*n)/x^7 - (2*b*d*e*n)/(25*x^5) - (b*e^2*n)/(9*x^3) - (d^2*(a +
b*Log[c*x^n]))/(7*x^7) - (2*d*e*(a + b*Log[c*x^n]))/(5*x^5) - (e^2*(a + b*L
og[c*x^n]))/(3*x^3)
```

fricas [A] time = 0.55, size = 112, normalized size = 1.18

$$-\frac{1225\left(be^2n+3\,ae^2\right)x^4+225\,bd^2n+1575\,ad^2+882\,(bden+5\,ade)x^2+105\left(35\,be^2x^4+42\,bdex^2+15\,bd^2\right)\mathrm{lo}}{11025\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")
```

```
[Out] -1/11025*(1225*(b*e^2*n + 3*a*e^2)*x^4 + 225*b*d^2*n + 1575*a*d^2 + 882*(b*
d*e*n + 5*a*d*e)*x^2 + 105*(35*b*e^2*x^4 + 42*b*d*e*x^2 + 15*b*d^2)*log(c)
+ 105*(35*b*e^2*n*x^4 + 42*b*d*e*n*x^2 + 15*b*d^2*n)*log(x))/x^7
```

giac [A] time = 0.29, size = 116, normalized size = 1.22

$$-\frac{3675\,bnx^4e^2\log(x)+1225\,bnx^4e^2+3675\,bx^4e^2\log(c)+4410\,bdnx^2e\log(x)+3675\,ax^4e^2+882\,bdnx^2e+44}{11025\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^8,x, algorithm="giac")
```

```
[Out] -1/11025*(3675*b*n*x^4*e^2*log(x) + 1225*b*n*x^4*e^2 + 3675*b*x^4*e^2*log(c
) + 4410*b*d*n*x^2*e*log(x) + 3675*a*x^4*e^2 + 882*b*d*n*x^2*e + 4410*b*d*x
^2*e*log(c) + 4410*a*d*x^2*e + 1575*b*d^2*n*log(x) + 225*b*d^2*n + 1575*b*d
^2*log(c) + 1575*a*d^2)/x^7
```

maple [C] time = 0.17, size = 419, normalized size = 4.41

$$-\frac{\left(35e^2x^4+42de\,x^2+15d^2\right)b\ln(x^n)}{105x^7}-\frac{-3675i\pi b\,e^2x^4\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)+3675i\pi b\,e^2x^4\mathrm{csgn}(ic)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(b*ln(c*x^n)+a)/x^8,x)
```

```
[Out] -1/105*b*(35*e^2*x^4+42*d*e*x^2+15*d^2)/x^7*ln(x^n)-1/22050*(1575*I*Pi*b*d^
2*csgn(I*x^n)*csgn(I*c*x^n)^2-3675*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3+3675*I*Pi
*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+4410*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn
(I*c*x^n)^2+7350*b*e^2*x^4*ln(c)+2450*b*e^2*n*x^4+7350*a*e^2*x^4-3675*I*Pi*
b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1575*I*Pi*b*d^2*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+4410*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1575*I
*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+8820*b*d*e*x^2*ln(c)+1764*b*d*e*n*x^2+8
820*a*d*e*x^2-4410*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3675*
I*Pi*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1575*I*Pi*b*d^2*csgn(I*c*x^n)^3-44
10*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^3+3150*b*d^2*ln(c)+450*b*d^2*n+3150*a*d^2)/
x^7
```

maxima [A] time = 0.46, size = 100, normalized size = 1.05

$$-\frac{be^2n}{9\,x^3}-\frac{be^2\log\left(cx^n\right)}{3\,x^3}-\frac{ae^2}{3\,x^3}-\frac{2\,bden}{25\,x^5}-\frac{2\,bde\log\left(cx^n\right)}{5\,x^5}-\frac{2\,ade}{5\,x^5}-\frac{bd^2n}{49\,x^7}-\frac{bd^2\log\left(cx^n\right)}{7\,x^7}-\frac{ad^2}{7\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^2*n/x^3 - 1/3*b*e^2*log(c*x^n)/x^3 - 1/3*a*e^2/x^3 - 2/25*b*d*e*n/
x^5 - 2/5*b*d*e*log(c*x^n)/x^5 - 2/5*a*d*e/x^5 - 1/49*b*d^2*n/x^7 - 1/7*b*d
^2*log(c*x^n)/x^7 - 1/7*a*d^2/x^7
```

mupad [B] time = 3.55, size = 89, normalized size = 0.94

$$-\frac{x^4\left(35\,a\,e^2+\frac{35\,b\,e^2\,n}{3}\right)+x^2\left(42\,a\,d\,e+\frac{42\,b\,d\,e\,n}{5}\right)+15\,a\,d^2+\frac{15\,b\,d^2\,n}{7}}{105\,x^7}-\frac{\ln\left(c\,x^n\right)\left(\frac{b\,d^2}{7}+\frac{2\,b\,d\,e\,x^2}{5}+\frac{b\,e^2\,x^4}{3}\right)}{x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^2*(a + b*log(c*x^n)))/x^8,x)
```

```
[Out] - (x^4*(35*a*e^2 + (35*b*e^2*n)/3) + x^2*(42*a*d*e + (42*b*d*e*n)/5) + 15*a
*d^2 + (15*b*d^2*n)/7)/(105*x^7) - (log(c*x^n)*((b*d^2)/7 + (b*e^2*x^4)/3 +
 (2*b*d*e*x^2)/5))/x^7
```

sympy [A] time = 10.08, size = 160, normalized size = 1.68

$$-\frac{ad^2}{7x^7}-\frac{2ade}{5x^5}-\frac{ae^2}{3x^3}-\frac{bd^2n\log\left(x\right)}{7x^7}-\frac{bd^2n}{49x^7}-\frac{bd^2\log\left(c\right)}{7x^7}-\frac{2bden\log\left(x\right)}{5x^5}-\frac{2bden}{25x^5}-\frac{2bde\log\left(c\right)}{5x^5}-\frac{be^2n\log\left(x\right)}{3x^3}-\frac{be^2n}{9x^3}-\frac{be^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] -a*d**2/(7*x**7) - 2*a*d*e/(5*x**5) - a*e**2/(3*x**3) - b*d**2*n*log(x)/(7*
x**7) - b*d**2*n/(49*x**7) - b*d**2*log(c)/(7*x**7) - 2*b*d*e*n*log(x)/(5*x
**5) - 2*b*d*e*n/(25*x**5) - 2*b*d*e*log(c)/(5*x**5) - b*e**2*n*log(x)/(3*x
**3) - b*e**2*n/(9*x**3) - b*e**2*log(c)/(3*x**3)
```

3.196 $\int x^5 \left(d+ex^2\right)^3 \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=100

$$\frac{1}{120}\left(20d^3x^6+45d^2ex^8+36de^2x^{10}+10e^3x^{12}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{36}bd^3nx^6-\frac{3}{64}bd^2enx^8-\frac{3}{100}bde^2nx^{10}-\frac{1}{144}be^3$$

```
[Out] -1/36*b*d^3*n*x^6-3/64*b*d^2*e*n*x^8-3/100*b*d*e^2*n*x^10-1/144*b*e^3*n*x^1
2+1/120*(10*e^3*x^12+36*d*e^2*x^10+45*d^2*e*x^8+20*d^3*x^6)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.11, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {266, 43, 2334, 12, 14}

$$\frac{1}{120}\left(45d^2ex^8+20d^3x^6+36de^2x^{10}+10e^3x^{12}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3}{64}bd^2enx^8-\frac{1}{36}bd^3nx^6-\frac{3}{100}bde^2nx^{10}-\frac{1}{144}be^3$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^6)/36 - (3*b*d^2*e*n*x^8)/64 - (3*b*d*e^2*n*x^10)/100 - (b*e^3*
n*x^12)/144 + ((20*d^3*x^6 + 45*d^2*e*x^8 + 36*d*e^2*x^10 + 10*e^3*x^12)*(a
 + b*Log[c*x^n]))/120
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^5 \left(d+ex^2\right)^3 \left(a+b\log\left(cx^n\right)\right) dx = \frac{1}{120}\left(20d^3x^6+45d^2ex^8+36de^2x^{10}+10e^3x^{12}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int$$
$$= \frac{1}{120}\left(20d^3x^6+45d^2ex^8+36de^2x^{10}+10e^3x^{12}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{120}(bn)$$
$$= \frac{1}{120}\left(20d^3x^6+45d^2ex^8+36de^2x^{10}+10e^3x^{12}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{120}(bn)$$
$$= -\frac{1}{36}bd^3nx^6-\frac{3}{64}bd^2enx^8-\frac{3}{100}bde^2nx^{10}-\frac{1}{144}be^3nx^{12}+\frac{1}{120}\left(20d^3x^6+\right.$$

Mathematica [A] time = 0.05, size = 120, normalized size = 1.20

$$\frac{x^6\left(120a\left(20d^3+45d^2ex^2+36de^2x^4+10e^3x^6\right)+120b\left(20d^3+45d^2ex^2+36de^2x^4+10e^3x^6\right)\log\left(cx^n\right)-bn\left(400a\right.\right.}{14400}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^6*(120*a*(20*d^3 + 45*d^2*e*x^2 + 36*d*e^2*x^4 + 10*e^3*x^6) - b*n*(400*
d^3 + 675*d^2*e*x^2 + 432*d*e^2*x^4 + 100*e^3*x^6) + 120*b*(20*d^3 + 45*d^2
*e*x^2 + 36*d*e^2*x^4 + 10*e^3*x^6)*Log[c*x^n]))/14400
```

fricas [A] time = 0.53, size = 167, normalized size = 1.67

$$-\frac{1}{144}\left(be^3n-12\,ae^3\right)x^{12}-\frac{3}{100}\left(bde^2n-10\,ade^2\right)x^{10}-\frac{3}{64}\left(bd^2en-8\,ad^2e\right)x^8-\frac{1}{36}\left(bd^3n-6\,ad^3\right)x^6+\frac{1}{120}\left(10\,be^3x^{12}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/144*(b*e^3*n - 12*a*e^3)*x^12 - 3/100*(b*d*e^2*n - 10*a*d*e^2)*x^10 - 3/
64*(b*d^2*e*n - 8*a*d^2*e)*x^8 - 1/36*(b*d^3*n - 6*a*d^3)*x^6 + 1/120*(10*b
*e^3*x^12 + 36*b*d*e^2*x^10 + 45*b*d^2*e*x^8 + 20*b*d^3*x^6)*log(c) + 1/120
*(10*b*e^3*n*x^12 + 36*b*d*e^2*n*x^10 + 45*b*d^2*e*n*x^8 + 20*b*d^3*n*x^6)*
log(x)
```

giac [A] time = 0.30, size = 173, normalized size = 1.73

$$\frac{1}{12}\,bnx^{12}e^3\log(x)-\frac{1}{144}\,bnx^{12}e^3+\frac{1}{12}\,bx^{12}e^3\log(c)+\frac{3}{10}\,bdnx^{10}e^2\log(x)+\frac{1}{12}\,ax^{12}e^3-\frac{3}{100}\,bdnx^{10}e^2+\frac{3}{10}\,bdx^{10}e^2\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/12*b*n*x^12*e^3*log(x) - 1/144*b*n*x^12*e^3 + 1/12*b*x^12*e^3*log(c) + 3/
10*b*d*n*x^10*e^2*log(x) + 1/12*a*x^12*e^3 - 3/100*b*d*n*x^10*e^2 + 3/10*b*
d*x^10*e^2*log(c) + 3/8*b*d^2*n*x^8*e*log(x) + 3/10*a*d*x^10*e^2 - 3/64*b*d
^2*n*x^8*e + 3/8*b*d^2*x^8*e*log(c) + 3/8*a*d^2*x^8*e + 1/6*b*d^3*n*x^6*log
(x) - 1/36*b*d^3*n*x^6 + 1/6*b*d^3*x^6*log(c) + 1/6*a*d^3*x^6
```

maple [C] time = 0.22, size = 602, normalized size = 6.02

$$\frac{3b\,d^2e\,x^8\ln(c)}{8}+\frac{3bd\,e^2x^{10}\ln(c)}{10}+\frac{a\,e^3x^{12}}{12}+\frac{3a\,d^2e\,x^8}{8}+\frac{b\,d^3x^6\ln(c)}{6}+\frac{b\,e^3x^{12}\ln(c)}{12}+\frac{3ad\,e^2x^{10}}{10}+\frac{\left(10e^3x^6+36d\,e^2x^4+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(e*x^2+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 3/8*ln(c)*b*d^2*e*x^8+3/10*ln(c)*b*d*e^2*x^10+1/12*a*e^3*x^12-3/16*I*Pi*b*d
^2*e*x^8*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3/20*I*Pi*b*d*e^2*x^10*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+3/8*a*d^2*e*x^8+1/6*ln(c)*b*d^3*x^6+1/12*ln(c)
*b*e^3*x^12+3/10*a*d*e^2*x^10+1/120*b*x^6*(10*e^3*x^6+36*d*e^2*x^4+45*d^2*e
*x^2+20*d^3)*ln(x^n)+1/6*a*d^3*x^6+3/16*I*Pi*b*d^2*e*x^8*csgn(I*c*x^n)^2*cs
gn(I*c)-1/24*I*Pi*b*e^3*x^12*csgn(I*c*x^n)^3-1/12*I*Pi*b*d^3*x^6*csgn(I*c*x
^n)^3-1/36*b*d^3*n*x^6-1/144*b*e^3*n*x^12-1/12*I*Pi*b*d^3*x^6*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+3/20*I*Pi*b*d*e^2*x^10*csgn(I*x^n)*csgn(I*c*x^n)^2+3
/20*I*Pi*b*d*e^2*x^10*csgn(I*c*x^n)^2*csgn(I*c)+3/16*I*Pi*b*d^2*e*x^8*csgn(
I*x^n)*csgn(I*c*x^n)^2-1/24*I*Pi*b*e^3*x^12*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)-3/20*I*Pi*b*d*e^2*x^10*csgn(I*c*x^n)^3+1/24*I*Pi*b*e^3*x^12*csgn(I*x^n
)*csgn(I*c*x^n)^2-3/64*b*d^2*e*n*x^8-3/100*b*d*e^2*n*x^10+1/12*I*Pi*b*d^3*x
^6*csgn(I*c*x^n)^2*csgn(I*c)-3/16*I*Pi*b*d^2*e*x^8*csgn(I*c*x^n)^3+1/24*I*P
i*b*e^3*x^12*csgn(I*c*x^n)^2*csgn(I*c)+1/12*I*Pi*b*d^3*x^6*csgn(I*x^n)*csgn
(I*c*x^n)^2
```

maxima [A] time = 0.48, size = 143, normalized size = 1.43

$$-\frac{1}{144}\,be^3nx^{12}+\frac{1}{12}\,be^3x^{12}\log\left(cx^n\right)+\frac{1}{12}\,ae^3x^{12}-\frac{3}{100}\,bde^2nx^{10}+\frac{3}{10}\,bde^2x^{10}\log\left(cx^n\right)+\frac{3}{10}\,ade^2x^{10}-\frac{3}{64}\,bd^2enx^8+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/144*b*e^3*n*x^12 + 1/12*b*e^3*x^12*log(c*x^n) + 1/12*a*e^3*x^12 - 3/100*
b*d*e^2*n*x^10 + 3/10*b*d*e^2*x^10*log(c*x^n) + 3/10*a*d*e^2*x^10 - 3/64*b*
d^2*e*n*x^8 + 3/8*b*d^2*e*x^8*log(c*x^n) + 3/8*a*d^2*e*x^8 - 1/36*b*d^3*n*x
^6 + 1/6*b*d^3*x^6*log(c*x^n) + 1/6*a*d^3*x^6
```

mupad [B] time = 3.52, size = 113, normalized size = 1.13

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^3\,x^6}{6}+\frac{3\,b\,d^2\,e\,x^8}{8}+\frac{3\,b\,d\,e^2\,x^{10}}{10}+\frac{b\,e^3\,x^{12}}{12}\right)+\frac{d^3\,x^6\,\left(6\,a-b\,n\right)}{36}+\frac{e^3\,x^{12}\,\left(12\,a-b\,n\right)}{144}+\frac{3\,d^2\,e\,x^8\,\left(8\,a-\right.}{64}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d + e*x^2)^3*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d^3*x^6)/6 + (b*e^3*x^12)/12 + (3*b*d^2*e*x^8)/8 + (3*b*d*e^
2*x^10)/10) + (d^3*x^6*(6*a - b*n))/36 + (e^3*x^12*(12*a - b*n))/144 + (3*d
^2*e*x^8*(8*a - b*n))/64 + (3*d*e^2*x^10*(10*a - b*n))/100
```

sympy [B] time = 47.09, size = 230, normalized size = 2.30

$$\frac{ad^3x^6}{6}+\frac{3ad^2ex^8}{8}+\frac{3ade^2x^{10}}{10}+\frac{ae^3x^{12}}{12}+\frac{bd^3nx^6\log\left(x\right)}{6}-\frac{bd^3nx^6}{36}+\frac{bd^3x^6\log\left(c\right)}{6}+\frac{3bd^2enx^8\log\left(x\right)}{8}-\frac{3bd^2enx^8}{64}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**6/6 + 3*a*d**2*e*x**8/8 + 3*a*d*e**2*x**10/10 + a*e**3*x**12/12 +
 b*d**3*n*x**6*log(x)/6 - b*d**3*n*x**6/36 + b*d**3*x**6*log(c)/6 + 3*b*d**
2*e*n*x**8*log(x)/8 - 3*b*d**2*e*n*x**8/64 + 3*b*d**2*e*x**8*log(c)/8 + 3*b
*d*e**2*n*x**10*log(x)/10 - 3*b*d*e**2*n*x**10/100 + 3*b*d*e**2*x**10*log(c
)/10 + b*e**3*n*x**12*log(x)/12 - b*e**3*n*x**12/144 + b*e**3*x**12*log(c)/
12
```

3.197 $\int x^3 \left(d+ex^2\right)^3 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=130

$$-\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{bd^5n\log(x)}{40e^2}+\frac{bd^4nx^2}{20e}+\frac{3}{80}bd^3nx^4+\frac{1}{60}bd^2enx^6+\frac{1}{320}bde^2nx$$

```
[Out] 1/20*b*d^4*n*x^2/e+3/80*b*d^3*n*x^4+1/60*b*d^2*e*n*x^6+1/320*b*d*e^2*n*x^8-
1/100*b*n*(e*x^2+d)^5/e^2+1/40*b*d^5*n*ln(x)/e^2-1/40*(5*d*(e*x^2+d)^4/e^2-
4*(e*x^2+d)^5/e^2)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.15, antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {266, 43, 2334, 12, 446, 80}

$$-\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{bd^5n\log(x)}{40e^2}+\frac{1}{60}bd^2enx^6+\frac{bd^4nx^2}{20e}+\frac{3}{80}bd^3nx^4+\frac{1}{320}bde^2nx$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (b*d^4*n*x^2)/(20*e) + (3*b*d^3*n*x^4)/80 + (b*d^2*e*n*x^6)/60 + (b*d*e^2*n
*x^8)/320 - (b*n*(d + e*x^2)^5)/(100*e^2) + (b*d^5*n*Log[x])/(40*e^2) - (((
5*d*(d + e*x^2)^4)/e^2 - (4*(d + e*x^2)^5)/e^2)*(a + b*Log[c*x^n]))/40
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
```

```
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^3\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)dx=-\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{\left(d+ex^2\right.}{}$$

$$=-\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int\frac{\left(d+ex^2\right)^4(-}{x}}{40e^2}$$

$$=-\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\,\mathrm{Subst}\left(\int\right.}{}$$

$$=-\frac{bn\left(d+ex^2\right)^5}{100e^2}-\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)+$$

$$=-\frac{bn\left(d+ex^2\right)^5}{100e^2}-\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)+$$

$$=\frac{bd^4nx^2}{20e}+\frac{3}{80}bd^3nx^4+\frac{1}{60}bd^2enx^6+\frac{1}{320}bde^2nx^8-\frac{bn\left(d+ex^2\right)^5}{100e^2}+\frac{bd}{}$$

Mathematica [A] time = 0.05, size = 120, normalized size = 0.92

$$\frac{x^4\left(120a\left(10d^3+20d^2ex^2+15de^2x^4+4e^3x^6\right)+120b\left(10d^3+20d^2ex^2+15de^2x^4+4e^3x^6\right)\log\left(cx^n\right)-bn\left(300d\right.\right.}{4800}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(120*a*(10*d^3 + 20*d^2*e*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6) - b*n*(300*d
^3 + 400*d^2*e*x^2 + 225*d*e^2*x^4 + 48*e^3*x^6) + 120*b*(10*d^3 + 20*d^2*e
*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6)*Log[c*x^n]))/4800
```

fricas [A] time = 0.62, size = 167, normalized size = 1.28

$$-\frac{1}{100}\left(be^3n-10\,ae^3\right)x^{10}-\frac{3}{64}\left(bde^2n-8\,ade^2\right)x^8-\frac{1}{12}\left(bd^2en-6\,ad^2e\right)x^6-\frac{1}{16}\left(bd^3n-4\,ad^3\right)x^4+\frac{1}{40}\left(4\,be^3x^{10}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/100*(b*e^3*n - 10*a*e^3)*x^10 - 3/64*(b*d*e^2*n - 8*a*d*e^2)*x^8 - 1/12*
(b*d^2*e*n - 6*a*d^2*e)*x^6 - 1/16*(b*d^3*n - 4*a*d^3)*x^4 + 1/40*(4*b*e^3*
```

```
x^10 + 15*b*d*e^2*x^8 + 20*b*d^2*e*x^6 + 10*b*d^3*x^4)*log(c) + 1/40*(4*b*e
^3*n*x^10 + 15*b*d*e^2*n*x^8 + 20*b*d^2*e*n*x^6 + 10*b*d^3*n*x^4)*log(x)
```

giac [A] time = 0.32, size = 173, normalized size = 1.33

$$\frac{1}{10}\,bnx^{10}e^3\log(x) - \frac{1}{100}\,bnx^{10}e^3 + \frac{1}{10}\,bx^{10}e^3\log(c) + \frac{3}{8}\,bdnx^8e^2\log(x) + \frac{1}{10}\,ax^{10}e^3 - \frac{3}{64}\,bdnx^8e^2 + \frac{3}{8}\,bdx^8e^2\log(c) + \frac{1}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/10*b*n*x^10*e^3*log(x) - 1/100*b*n*x^10*e^3 + 1/10*b*x^10*e^3*log(c) + 3/
8*b*d*n*x^8*e^2*log(x) + 1/10*a*x^10*e^3 - 3/64*b*d*n*x^8*e^2 + 3/8*b*d*x^8
*e^2*log(c) + 1/2*b*d^2*n*x^6*e*log(x) + 3/8*a*d*x^8*e^2 - 1/12*b*d^2*n*x^6
*e + 1/2*b*d^2*x^6*e*log(c) + 1/2*a*d^2*x^6*e + 1/4*b*d^3*n*x^4*log(x) - 1/
16*b*d^3*n*x^4 + 1/4*b*d^3*x^4*log(c) + 1/4*a*d^3*x^4
```

maple [C] time = 0.22, size = 602, normalized size = 4.63

$$\frac{b\,d^2e\,x^6\ln(c)}{2} + \frac{3bd\,e^2x^8\ln(c)}{8} + \frac{3i\pi bd\,e^2x^8\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{16} - \frac{b\,e^3n\,x^{10}}{100} + \frac{a\,d^3x^4}{4} + \frac{\left(4e^3x^6 + 15d\,e^2x^4 + 20d^2e\,x^2\right.}{40}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/2*ln(c)*b*d^2*e*x^6+3/8*ln(c)*b*d*e^2*x^8-1/100*b*e^3*n*x^10+1/4*a*d^3*x^
4+1/40*b*x^4*(4*e^3*x^6+15*d*e^2*x^4+20*d^2*e*x^2+10*d^3)*ln(x^n)+1/4*b*d^3
*x^4*ln(c)-1/4*I*Pi*b*d^2*e*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/10*a*
e^3*x^10+1/10*ln(c)*b*e^3*x^10+3/8*a*d*e^2*x^8+1/2*a*d^2*e*x^6-1/16*b*d^3*n
*x^4-1/20*I*Pi*b*e^3*x^10*csgn(I*c*x^n)^3-1/8*I*Pi*b*d^3*x^4*csgn(I*c*x^n)^
3-3/16*I*Pi*b*d*e^2*x^8*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/20*I*Pi*b*e^3
*x^10*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/16*I*Pi*b*d*e^2*x^8*csgn(I*c*x^
n)^2*csgn(I*c)+3/16*I*Pi*b*d*e^2*x^8*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*Pi*b
*d^2*e*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*Pi*b*d^2*e*x^6*csgn(I*c*x^n)^2
*csgn(I*c)-1/8*I*Pi*b*d^3*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/8*I*Pi*
b*d^3*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+1/8*I*Pi*b*d^3*x^4*csgn(I*c*x^n)^2*cs
gn(I*c)-3/16*I*Pi*b*d*e^2*x^8*csgn(I*c*x^n)^3-1/12*b*d^2*e*n*x^6-3/64*b*d*e
^2*n*x^8+1/20*I*Pi*b*e^3*x^10*csgn(I*c*x^n)^2*csgn(I*c)-1/4*I*Pi*b*d^2*e*x^
6*csgn(I*c*x^n)^3+1/20*I*Pi*b*e^3*x^10*csgn(I*x^n)*csgn(I*c*x^n)^2
```

maxima [A] time = 0.54, size = 143, normalized size = 1.10

$$-\frac{1}{100}\,be^3nx^{10} + \frac{1}{10}\,be^3x^{10}\log\left(cx^n\right) + \frac{1}{10}\,ae^3x^{10} - \frac{3}{64}\,bde^2nx^8 + \frac{3}{8}\,bde^2x^8\log\left(cx^n\right) + \frac{3}{8}\,ade^2x^8 - \frac{1}{12}\,bd^2enx^6 + \frac{1}{2}\,bd^2ex^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/100*b*e^3*n*x^10 + 1/10*b*e^3*x^10*log(c*x^n) + 1/10*a*e^3*x^10 - 3/64*b
*d*e^2*n*x^8 + 3/8*b*d*e^2*x^8*log(c*x^n) + 3/8*a*d*e^2*x^8 - 1/12*b*d^2*e*
n*x^6 + 1/2*b*d^2*e*x^6*log(c*x^n) + 1/2*a*d^2*e*x^6 - 1/16*b*d^3*n*x^4 + 1
/4*b*d^3*x^4*log(c*x^n) + 1/4*a*d^3*x^4
```

mupad [B] time = 3.48, size = 113, normalized size = 0.87

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^3\,x^4}{4} + \frac{b\,d^2\,e\,x^6}{2} + \frac{3\,b\,d\,e^2\,x^8}{8} + \frac{b\,e^3\,x^{10}}{10}\right) + \frac{d^3\,x^4\,\left(4\,a - b\,n\right)}{16} + \frac{e^3\,x^{10}\,\left(10\,a - b\,n\right)}{100} + \frac{d^2\,e\,x^6\,\left(6\,a - b\,n\right)}{12} + \frac{3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d + e*x^2)^3*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d^3*x^4)/4 + (b*e^3*x^10)/10 + (b*d^2*e*x^6)/2 + (3*b*d*e^2*
x^8)/8) + (d^3*x^4*(4*a - b*n))/16 + (e^3*x^10*(10*a - b*n))/100 + (d^2*e*x
^6*(6*a - b*n))/12 + (3*d*e^2*x^8*(8*a - b*n))/64
```

sympy [A] time = 22.60, size = 223, normalized size = 1.72

$$\frac{ad^3x^4}{4}+\frac{ad^2ex^6}{2}+\frac{3ade^2x^8}{8}+\frac{ae^3x^{10}}{10}+\frac{bd^3nx^4\log(x)}{4}-\frac{bd^3nx^4}{16}+\frac{bd^3x^4\log(c)}{4}+\frac{bd^2enx^6\log(x)}{2}-\frac{bd^2enx^6}{12}+\frac{bd^2ex^6}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**4/4 + a*d**2*e*x**6/2 + 3*a*d*e**2*x**8/8 + a*e**3*x**10/10 + b*d
**3*n*x**4*log(x)/4 - b*d**3*n*x**4/16 + b*d**3*x**4*log(c)/4 + b*d**2*e*n*
x**6*log(x)/2 - b*d**2*e*n*x**6/12 + b*d**2*e*x**6*log(c)/2 + 3*b*d*e**2*n*
x**8*log(x)/8 - 3*b*d*e**2*n*x**8/64 + 3*b*d*e**2*x**8*log(c)/8 + b*e**3*n*
x**10*log(x)/10 - b*e**3*n*x**10/100 + b*e**3*x**10*log(c)/10
```

3.198 $\int x\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)dx$

Optimal. Leaf size=91

$$\frac{\left(d+ex^2\right)^4\left(a+b\log\left(cx^n\right)\right)}{8e}-\frac{bd^4n\log(x)}{8e}-\frac{1}{4}bd^3nx^2-\frac{3}{16}bd^2enx^4-\frac{1}{12}bde^2nx^6-\frac{1}{64}be^3nx^8$$

```
[Out] -1/4*b*d^3*n*x^2-3/16*b*d^2*e*n*x^4-1/12*b*d*e^2*n*x^6-1/64*b*e^3*n*x^8-1/8
*b*d^4*n*ln(x)/e+1/8*(e*x^2+d)^4*(a+b*ln(c*x^n))/e
```

Rubi [A] time = 0.07, antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {261, 2334, 12, 266, 43}

$$\frac{\left(d+ex^2\right)^4\left(a+b\log\left(cx^n\right)\right)}{8e}-\frac{3}{16}bd^2enx^4-\frac{bd^4n\log(x)}{8e}-\frac{1}{4}bd^3nx^2-\frac{1}{12}bde^2nx^6-\frac{1}{64}be^3nx^8$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^2)/4 - (3*b*d^2*e*n*x^4)/16 - (b*d*e^2*n*x^6)/12 - (b*e^3*n*x^8
)/64 - (b*d^4*n*Log[x])/(8*e) + ((d + e*x^2)^4*(a + b*Log[c*x^n]))/(8*e)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)dx=\frac{\left(d+ex^2\right)^4\left(a+b\log\left(cx^n\right)\right)}{8e}-(bn)\int\frac{\left(d+ex^2\right)^4}{8ex}dx$$
$$=\frac{\left(d+ex^2\right)^4\left(a+b\log\left(cx^n\right)\right)}{8e}-\frac{(bn)\int\frac{\left(d+ex^2\right)^4}{x}dx}{8e}$$
$$=\frac{\left(d+ex^2\right)^4\left(a+b\log\left(cx^n\right)\right)}{8e}-\frac{(bn)\,\mathrm{Subst}\left(\int\frac{(d+ex)^4}{x}dx,x,x^2\right)}{16e}$$
$$=\frac{\left(d+ex^2\right)^4\left(a+b\log\left(cx^n\right)\right)}{8e}-\frac{(bn)\,\mathrm{Subst}\left(\int\left(4d^3e+\frac{d^4}{x}+6d^2e^2x+4de^3\right.\right.}{16e}$$
$$=-\frac{1}{4}bd^3nx^2-\frac{3}{16}bd^2enx^4-\frac{1}{12}bde^2nx^6-\frac{1}{64}be^3nx^8-\frac{bd^4n\log(x)}{8e}+\frac{(d+}{}$$

Mathematica [A] time = 0.05, size = 118, normalized size = 1.30

$$\frac{1}{192}x^2\left(24a\left(4d^3+6d^2ex^2+4de^2x^4+e^3x^6\right)+24b\left(4d^3+6d^2ex^2+4de^2x^4+e^3x^6\right)\log\left(cx^n\right)-bn\left(48d^3+36d^2\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(24*a*(4*d^3 + 6*d^2*e*x^2 + 4*d*e^2*x^4 + e^3*x^6) - b*n*(48*d^3 + 36
*d^2*e*x^2 + 16*d*e^2*x^4 + 3*e^3*x^6) + 24*b*(4*d^3 + 6*d^2*e*x^2 + 4*d*e^
2*x^4 + e^3*x^6)*Log[c*x^n]))/192
```

fricas [B] time = 0.67, size = 165, normalized size = 1.81

$$-\frac{1}{64}\left(be^3n-8\,ae^3\right)x^8-\frac{1}{12}\left(bde^2n-6\,ade^2\right)x^6-\frac{3}{16}\left(bd^2en-4\,ad^2e\right)x^4-\frac{1}{4}\left(bd^3n-2\,ad^3\right)x^2+\frac{1}{8}\left(be^3x^8+4\,bde^2x^6\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/64*(b*e^3*n - 8*a*e^3)*x^8 - 1/12*(b*d*e^2*n - 6*a*d*e^2)*x^6 - 3/16*(b*
d^2*e*n - 4*a*d^2*e)*x^4 - 1/4*(b*d^3*n - 2*a*d^3)*x^2 + 1/8*(b*e^3*x^8 + 4
*b*d*e^2*x^6 + 6*b*d^2*e*x^4 + 4*b*d^3*x^2)*log(c) + 1/8*(b*e^3*n*x^8 + 4*b
*d*e^2*n*x^6 + 6*b*d^2*e*n*x^4 + 4*b*d^3*n*x^2)*log(x)
```

giac [B] time = 0.28, size = 173, normalized size = 1.90

$$\frac{1}{8}\,bnx^8e^3\log(x)-\frac{1}{64}\,bnx^8e^3+\frac{1}{8}\,bx^8e^3\log(c)+\frac{1}{2}\,bdnx^6e^2\log(x)+\frac{1}{8}\,ax^8e^3-\frac{1}{12}\,bdnx^6e^2+\frac{1}{2}\,bdx^6e^2\log(c)+\frac{3}{4}\,bd^2n$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/8*b*n*x^8*e^3*log(x) - 1/64*b*n*x^8*e^3 + 1/8*b*x^8*e^3*log(c) + 1/2*b*d*
n*x^6*e^2*log(x) + 1/8*a*x^8*e^3 - 1/12*b*d*n*x^6*e^2 + 1/2*b*d*x^6*e^2*log
(c) + 3/4*b*d^2*n*x^4*e*log(x) + 1/2*a*d*x^6*e^2 - 3/16*b*d^2*n*x^4*e + 3/4
*b*d^2*x^4*e*log(c) + 3/4*a*d^2*x^4*e + 1/2*b*d^3*n*x^2*log(x) - 1/4*b*d^3*
n*x^2 + 1/2*b*d^3*x^2*log(c) + 1/2*a*d^3*x^2
```

maple [C] time = 0.24, size = 601, normalized size = 6.60

$$\frac{a\,d^3x^2}{2}+\frac{3a\,d^2e\,x^4}{4}+\frac{bd\,e^2x^6\ln(c)}{2}+\frac{3b\,d^2e\,x^4\ln(c)}{4}+\frac{b\,e^3x^8\ln(c)}{8}+\frac{b\,d^3x^2\ln(c)}{2}+\frac{\left(e^3x^6+4d\,e^2x^4+6d^2e\,x^2+4d^3\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/2*a*d^3*x^2+3/4*a*d^2*e*x^4+1/2*b*d*e^2*x^6*ln(c)+3/4*b*d^2*e*x^4*ln(c)+1
/8*ln(c)*b*e^3*x^8+1/2*b*d^3*x^2*ln(c)+1/8*b*x^2*(e^3*x^6+4*d*e^2*x^4+6*d^2
*e*x^2+4*d^3)*ln(x^n)+1/2*a*d*e^2*x^6+1/8*a*e^3*x^8-3/8*I*Pi*b*d^2*e*x^4*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4*I*Pi*b*d*e^2*x^6*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)-1/4*b*d^3*n*x^2+3/8*I*Pi*b*d^2*e*x^4*csgn(I*x^n)*csgn(I*c*x
^n)^2-1/4*I*Pi*b*d^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi*b*d*e
^2*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*Pi*b*d*e^2*x^6*csgn(I*c*x^n)^2*csg
n(I*c)+3/8*I*Pi*b*d^2*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1/16*I*Pi*b*e^3*x^8*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/64*b*e^3*n*x^8-1/4*I*Pi*b*d^3*x^2*csgn
(I*c*x^n)^3-1/16*I*Pi*b*e^3*x^8*csgn(I*c*x^n)^3-3/8*I*Pi*b*d^2*e*x^4*csgn(I
*c*x^n)^3+1/4*I*Pi*b*d^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*Pi*b*d*e^2*x
^6*csgn(I*c*x^n)^3+1/16*I*Pi*b*e^3*x^8*csgn(I*c*x^n)^2*csgn(I*c)+1/16*I*Pi*
b*e^3*x^8*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*Pi*b*d^3*x^2*csgn(I*c*x^n)^2*cs
gn(I*c)-1/12*b*d*e^2*n*x^6-3/16*b*d^2*e*n*x^4
```

maxima [A] time = 0.49, size = 143, normalized size = 1.57

$$-\frac{1}{64}\,be^3nx^8+\frac{1}{8}\,be^3x^8\log\left(cx^n\right)+\frac{1}{8}\,ae^3x^8-\frac{1}{12}\,bde^2nx^6+\frac{1}{2}\,bde^2x^6\log\left(cx^n\right)+\frac{1}{2}\,ade^2x^6-\frac{3}{16}\,bd^2enx^4+\frac{3}{4}\,bd^2ex^4\log\left(cx\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/64*b*e^3*n*x^8 + 1/8*b*e^3*x^8*log(c*x^n) + 1/8*a*e^3*x^8 - 1/12*b*d*e^2
*n*x^6 + 1/2*b*d*e^2*x^6*log(c*x^n) + 1/2*a*d*e^2*x^6 - 3/16*b*d^2*e*n*x^4
+ 3/4*b*d^2*e*x^4*log(c*x^n) + 3/4*a*d^2*e*x^4 - 1/4*b*d^3*n*x^2 + 1/2*b*d^
3*x^2*log(c*x^n) + 1/2*a*d^3*x^2
```

mupad [B] time = 3.49, size = 113, normalized size = 1.24

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^3\,x^2}{2}+\frac{3\,b\,d^2\,e\,x^4}{4}+\frac{b\,d\,e^2\,x^6}{2}+\frac{b\,e^3\,x^8}{8}\right)+\frac{d^3\,x^2\,\left(2\,a-b\,n\right)}{4}+\frac{e^3\,x^8\,\left(8\,a-b\,n\right)}{64}+\frac{3\,d^2\,e\,x^4\,\left(4\,a-b\,n\right)}{16}+\frac{d\,e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d + e*x^2)^3*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d^3*x^2)/2 + (b*e^3*x^8)/8 + (3*b*d^2*e*x^4)/4 + (b*d*e^2*x^
6)/2) + (d^3*x^2*(2*a - b*n))/4 + (e^3*x^8*(8*a - b*n))/64 + (3*d^2*e*x^4*(
4*a - b*n))/16 + (d*e^2*x^6*(6*a - b*n))/12
```

sympy [B] time = 9.99, size = 223, normalized size = 2.45

$$\frac{ad^3x^2}{2}+\frac{3ad^2ex^4}{4}+\frac{ade^2x^6}{2}+\frac{ae^3x^8}{8}+\frac{bd^3nx^2\log\left(x\right)}{2}-\frac{bd^3nx^2}{4}+\frac{bd^3x^2\log\left(c\right)}{2}+\frac{3bd^2enx^4\log\left(x\right)}{4}-\frac{3bd^2enx^4}{16}+\frac{3bd^2ex^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**2/2 + 3*a*d**2*e*x**4/4 + a*d*e**2*x**6/2 + a*e**3*x**8/8 + b*d**
3*n*x**2*log(x)/2 - b*d**3*n*x**2/4 + b*d**3*x**2*log(c)/2 + 3*b*d**2*e*n*x
**4*log(x)/4 - 3*b*d**2*e*n*x**4/16 + 3*b*d**2*e*x**4*log(c)/4 + b*d*e**2*n
*x**6*log(x)/2 - b*d*e**2*n*x**6/12 + b*d*e**2*x**6*log(c)/2 + b*e**3*n*x**
8*log(x)/8 - b*e**3*n*x**8/64 + b*e**3*x**8*log(c)/8
```

3.199 $\int \frac{(d+ex^2)^3 (a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=130

$$d^3\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{3}{2}d^2ex^2\left(a+b\log\left(cx^n\right)\right)+\frac{3}{4}de^2x^4\left(a+b\log\left(cx^n\right)\right)+\frac{1}{6}e^3x^6\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^3n$$

```
[Out] -3/4*b*d^2*e*n*x^2-3/16*b*d*e^2*n*x^4-1/36*b*e^3*n*x^6-1/2*b*d^3*n*ln(x)^2+
3/2*d^2*e*x^2*(a+b*ln(c*x^n))+3/4*d*e^2*x^4*(a+b*ln(c*x^n))+1/6*e^3*x^6*(a+
b*ln(c*x^n))+d^3*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.10, antiderivative size = 100, normalized size of antiderivative = 0.77, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {266, 43, 2334, 14, 2301}

$$\frac{1}{12}\left(18d^2ex^2+12d^3\log(x)+9de^2x^4+2e^3x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3}{4}bd^2enx^2-\frac{1}{2}bd^3n\log^2(x)-\frac{3}{16}bde^2nx^4-\frac{1}{36}be^3n$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-3*b*d^2*e*n*x^2)/4 - (3*b*d*e^2*n*x^4)/16 - (b*e^3*n*x^6)/36 - (b*d^3*n*L
og[x]^2)/2 + ((18*d^2*e*x^2 + 9*d*e^2*x^4 + 2*e^3*x^6 + 12*d^3*Log[x])*(a +
 b*Log[c*x^n]))/12
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{x}\,dx = \frac{1}{12}\left(18d^2ex^2+9de^2x^4+2e^3x^6+12d^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(\frac{1}{12}\right.$$
$$=\frac{1}{12}\left(18d^2ex^2+9de^2x^4+2e^3x^6+12d^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\left(bd^3n\right)\int\frac{\log}{}$$
$$=-\frac{1}{2}bd^3n\log^2(x)+\frac{1}{12}\left(18d^2ex^2+9de^2x^4+2e^3x^6+12d^3\log(x)\right)\left(a+b\log(c\right.$$
$$=-\frac{3}{4}bd^2enx^2-\frac{3}{16}bde^2nx^4-\frac{1}{36}be^3nx^6-\frac{1}{2}bd^3n\log^2(x)+\frac{1}{12}\left(18d^2ex^2+9de^2\right.$$

Mathematica [A] time = 0.06, size = 116, normalized size = 0.89

$$\frac{1}{144}\left(\frac{72d^3\left(a+b\log\left(cx^n\right)\right)^2}{bn}+216d^2ex^2\left(a+b\log\left(cx^n\right)\right)+108de^2x^4\left(a+b\log\left(cx^n\right)\right)+24e^3x^6\left(a+b\log\left(cx^n\right)\right)\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-108*b*d^2*e*n*x^2 - 27*b*d*e^2*n*x^4 - 4*b*e^3*n*x^6 + 216*d^2*e*x^2*(a +
 b*Log[c*x^n]) + 108*d*e^2*x^4*(a + b*Log[c*x^n]) + 24*e^3*x^6*(a + b*Log[c
*x^n]) + (72*d^3*(a + b*Log[c*x^n])^2)/(b*n))/144
```

fricas [A] time = 0.77, size = 155, normalized size = 1.19

$$-\frac{1}{36}\left(be^3n-6\,ae^3\right)x^6+\frac{1}{2}\,bd^3n\log(x)^2-\frac{3}{16}\left(bde^2n-4\,ade^2\right)x^4-\frac{3}{4}\left(bd^2en-2\,ad^2e\right)x^2+\frac{1}{12}\left(2\,be^3x^6+9\,bde^2x^4+18\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] -1/36*(b*e^3*n - 6*a*e^3)*x^6 + 1/2*b*d^3*n*log(x)^2 - 3/16*(b*d*e^2*n - 4*
a*d*e^2)*x^4 - 3/4*(b*d^2*e*n - 2*a*d^2*e)*x^2 + 1/12*(2*b*e^3*x^6 + 9*b*d*
e^2*x^4 + 18*b*d^2*e*x^2)*log(c) + 1/12*(2*b*e^3*n*x^6 + 9*b*d*e^2*n*x^4 +
18*b*d^2*e*n*x^2 + 12*b*d^3*log(c) + 12*a*d^3)*log(x)
```

giac [A] time = 0.27, size = 158, normalized size = 1.22

$$\frac{1}{6}\,bnx^6e^3\log(x)-\frac{1}{36}\,bnx^6e^3+\frac{1}{6}\,bx^6e^3\log(c)+\frac{3}{4}\,bdnx^4e^2\log(x)+\frac{1}{6}\,ax^6e^3-\frac{3}{16}\,bdnx^4e^2+\frac{3}{4}\,bdx^4e^2\log(c)+\frac{3}{2}\,bd^2nx^2e$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/6*b*n*x^6*e^3*log(x) - 1/36*b*n*x^6*e^3 + 1/6*b*x^6*e^3*log(c) + 3/4*b*d*
n*x^4*e^2*log(x) + 1/6*a*x^6*e^3 - 3/16*b*d*n*x^4*e^2 + 3/4*b*d*x^4*e^2*log
(c) + 3/2*b*d^2*n*x^2*e*log(x) + 3/4*a*d*x^4*e^2 - 3/4*b*d^2*n*x^2*e + 3/2*
b*d^2*x^2*e*log(c) + 1/2*b*d^3*n*log(x)^2 + 3/2*a*d^2*x^2*e + b*d^3*log(c)*
log(x) + a*d^3*log(x)
```

maple [C] time = 0.30, size = 595, normalized size = 4.58

$$\frac{a\,e^3x^6}{6}+\frac{3bd\,e^2x^4\ln(c)}{4}+\frac{3ad\,e^2x^4}{4}+\left(\frac{b\,e^3x^6}{6}+\frac{3bd\,e^2x^4}{4}+\frac{3b\,d^2e\,x^2}{2}+b\,d^3\ln(x)\right)\ln\left(x^n\right)+\frac{b\,e^3x^6\ln(c)}{6}+\frac{3a\,d^2e\,x^2}{2}+b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] -1/2*I*ln(x)*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/4*I*Pi*b*d^2*e*
x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/6*a*e^3*x^6+3/4*b*d*e^2*x^4*ln(c)+3/4*a*d*e
^2*x^4+(1/6*b*e^3*x^6+3/4*b*d*e^2*x^4+3/2*b*d^2*e*x^2+b*d^3*ln(x))*ln(x^n)+
1/6*b*e^3*x^6*ln(c)+3/2*a*d^2*e*x^2+b*d^3*ln(c)*ln(x)+a*d^3*ln(x)-3/8*I*Pi*
b*d*e^2*x^4*csgn(I*c*x^n)^3-3/4*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^3-1/12*I*Pi*
b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/8*I*Pi*b*d*e^2*x^4*csgn(I*x
^n)*csgn(I*c*x^n)^2+3/2*ln(c)*b*d^2*e*x^2-1/36*b*e^3*n*x^6+3/4*I*Pi*b*d^2*e
*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-3/4*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)+3/8*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-3/8*I*Pi*b*d*
e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*ln(x)*Pi*b*d^3*csgn(I*x^n
)*csgn(I*c*x^n)^2+1/2*I*ln(x)*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+1/12*I*Pi*
b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+1/12*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*c
sgn(I*c)-1/12*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^3-1/2*I*ln(x)*Pi*b*d^3*csgn(I*c*
x^n)^3-1/2*b*d^3*n*ln(x)^2-3/16*b*d*e^2*n*x^4-3/4*b*d^2*e*n*x^2
```

maxima [A] time = 0.49, size = 133, normalized size = 1.02

$$-\frac{1}{36}\,be^3nx^6+\frac{1}{6}\,be^3x^6\log\left(cx^n\right)+\frac{1}{6}\,ae^3x^6-\frac{3}{16}\,bde^2nx^4+\frac{3}{4}\,bde^2x^4\log\left(cx^n\right)+\frac{3}{4}\,ade^2x^4-\frac{3}{4}\,bd^2enx^2+\frac{3}{2}\,bd^2ex^2\log($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] -1/36*b*e^3*n*x^6 + 1/6*b*e^3*x^6*log(c*x^n) + 1/6*a*e^3*x^6 - 3/16*b*d*e^2
*n*x^4 + 3/4*b*d*e^2*x^4*log(c*x^n) + 3/4*a*d*e^2*x^4 - 3/4*b*d^2*e*n*x^2 +
 3/2*b*d^2*e*x^2*log(c*x^n) + 3/2*a*d^2*e*x^2 + 1/2*b*d^3*log(c*x^n)^2/n +
a*d^3*log(x)
```

mupad [B] time = 3.67, size = 112, normalized size = 0.86

$$\ln\left(c\,x^n\right)\,\left(\frac{3\,b\,d^2\,e\,x^2}{2}+\frac{3\,b\,d\,e^2\,x^4}{4}+\frac{b\,e^3\,x^6}{6}\right)+\frac{e^3\,x^6\,\left(6\,a-b\,n\right)}{36}+a\,d^3\,\ln(x)+\frac{b\,d^3\,\ln\left(c\,x^n\right)^2}{2\,n}+\frac{3\,d^2\,e\,x^2\,\left(2\,a-b\,n\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^3*(a + b*log(c*x^n)))/x,x)
```

```
[Out] log(c*x^n)*((b*e^3*x^6)/6 + (3*b*d^2*e*x^2)/2 + (3*b*d*e^2*x^4)/4) + (e^3*x
^6*(6*a - b*n))/36 + a*d^3*log(x) + (b*d^3*log(c*x^n)^2)/(2*n) + (3*d^2*e*x
^2*(2*a - b*n))/4 + (3*d*e^2*x^4*(4*a - b*n))/16
```

sympy [A] time = 6.66, size = 212, normalized size = 1.63

$$ad^3\log\left(x\right)+\frac{3ad^2ex^2}{2}+\frac{3ade^2x^4}{4}+\frac{ae^3x^6}{6}+\frac{bd^3n\log\left(x\right)^2}{2}+bd^3\log\left(c\right)\log\left(x\right)+\frac{3bd^2enx^2\log\left(x\right)}{2}-\frac{3bd^2enx^2}{4}+\frac{3bd^2e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x,x)
```

```
[Out] a*d**3*log(x) + 3*a*d**2*e*x**2/2 + 3*a*d*e**2*x**4/4 + a*e**3*x**6/6 + b*d
**3*n*log(x)**2/2 + b*d**3*log(c)*log(x) + 3*b*d**2*e*n*x**2*log(x)/2 - 3*b
*d**2*e*n*x**2/4 + 3*b*d**2*e*x**2*log(c)/2 + 3*b*d*e**2*n*x**4*log(x)/4 -
3*b*d*e**2*n*x**4/16 + 3*b*d*e**2*x**4*log(c)/4 + b*e**3*n*x**6*log(x)/6 -
b*e**3*n*x**6/36 + b*e**3*x**6*log(c)/6
```

3.200 $\int \frac{(d+ex^2)^3(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=131

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{2x^2}+3d^2e\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{3}{2}de^2x^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}e^3x^4\left(a+b\log\left(cx^n\right)\right)-\frac{bd^3n}{4x^2}-\frac{3}{2}b$$

```
[Out] -1/4*b*d^3*n/x^2-3/4*b*d*e^2*n*x^2-1/16*b*e^3*n*x^4-3/2*b*d^2*e*n*ln(x)^2-1
/2*d^3*(a+b*ln(c*x^n))/x^2+3/2*d*e^2*x^2*(a+b*ln(c*x^n))+1/4*e^3*x^4*(a+b*l
n(c*x^n))+3*d^2*e*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.12, antiderivative size = 100, normalized size of antiderivative = 0.76, number of steps used = 7, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {266, 43, 2334, 12, 14, 2301}

$$-\frac{1}{4}\left(-12d^2e\log(x)+\frac{2d^3}{x^2}-6de^2x^2-e^3x^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3}{2}bd^2en\log^2(x)-\frac{bd^3n}{4x^2}-\frac{3}{4}bde^2nx^2-\frac{1}{16}be^3nx^4$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d^3*n)/(4*x^2) - (3*b*d*e^2*n*x^2)/4 - (b*e^3*n*x^4)/16 - (3*b*d^2*e*n*
Log[x]^2)/2 - (((2*d^3)/x^2 - 6*d*e^2*x^2 - e^3*x^4 - 12*d^2*e*Log[x])*(a +
 b*Log[c*x^n]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
```

```
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx = -\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3x^4-12d^2e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{-2d^3}{}$$
$$=-\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3x^4-12d^2e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(bn)\int\frac{-2d}{}$$
$$=-\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3x^4-12d^2e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(bn)\int\Big(\frac{-2}{}$$
$$=-\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3x^4-12d^2e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(bn)\int\frac{-2d}{}$$
$$=-\frac{3}{2}bd^2en\log^2(x)-\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3x^4-12d^2e\log(x)\right)\left(a+b\log\left(cx\right.\right.$$
$$=-\frac{bd^3n}{4x^2}-\frac{3}{4}bde^2nx^2-\frac{1}{16}be^3nx^4-\frac{3}{2}bd^2en\log^2(x)-\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3\right.$$

Mathematica [A] time = 0.09, size = 115, normalized size = 0.88

$$\frac{1}{16}\left(-\frac{8d^3\left(a+b\log\left(cx^n\right)\right)}{x^2}+\frac{24d^2e\left(a+b\log\left(cx^n\right)\right)^2}{bn}+24de^2x^2\left(a+b\log\left(cx^n\right)\right)+4e^3x^4\left(a+b\log\left(cx^n\right)\right)-\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] ((-4*b*d^3*n)/x^2 - 12*b*d*e^2*n*x^2 - b*e^3*n*x^4 - (8*d^3*(a + b*Log[c*x^
n]))/x^2 + 24*d*e^2*x^2*(a + b*Log[c*x^n]) + 4*e^3*x^4*(a + b*Log[c*x^n]) +
 (24*d^2*e*(a + b*Log[c*x^n])^2)/(b*n))/16
```

fricas [A] time = 0.86, size = 155, normalized size = 1.18

$$\frac{24\,bd^2enx^2\log(x)^2-\left(be^3n-4\,ae^3\right)x^6-4\,bd^3n-12\left(bde^2n-2\,ade^2\right)x^4-8\,ad^3+4\left(be^3x^6+6\,bde^2x^4-2\,bd^3\right)}{16\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] 1/16*(24*b*d^2*e*n*x^2*log(x)^2 - (b*e^3*n - 4*a*e^3)*x^6 - 4*b*d^3*n - 12*
(b*d*e^2*n - 2*a*d*e^2)*x^4 - 8*a*d^3 + 4*(b*e^3*x^6 + 6*b*d*e^2*x^4 - 2*b*
d^3)*log(c) + 4*(b*e^3*n*x^6 + 6*b*d*e^2*n*x^4 + 12*b*d^2*e*x^2*log(c) + 12
*a*d^2*e*x^2 - 2*b*d^3*n)*log(x))/x^2
```

giac [A] time = 0.42, size = 160, normalized size = 1.22

$$\frac{4\,bnx^6e^3\log(x)-bnx^6e^3+4\,bx^6e^3\log(c)+24\,bdnx^4e^2\log(x)+24\,bd^2nx^2e\log(x)^2+4\,ax^6e^3-12\,bdnx^4e^2+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] 1/16*(4*b*n*x^6*e^3*log(x) - b*n*x^6*e^3 + 4*b*x^6*e^3*log(c) + 24*b*d*n*x^
4*e^2*log(x) + 24*b*d^2*n*x^2*e*log(x)^2 + 4*a*x^6*e^3 - 12*b*d*n*x^4*e^2 +
 24*b*d*x^4*e^2*log(c) + 48*b*d^2*x^2*e*log(c)*log(x) + 24*a*d*x^4*e^2 + 48
*a*d^2*x^2*e*log(x) - 8*b*d^3*n*log(x) - 4*b*d^3*n - 8*b*d^3*log(c) - 8*a*d
^3)/x^2
```

maple [C] time = 0.33, size = 604, normalized size = 4.61

$$-\frac{\left(-e^3x^6-6d\,e^2x^4-12d^2e\,x^2\ln(x)+2d^3\right)b\ln\left(x^n\right)}{4x^2}-\frac{-4a\,e^3x^6-24bd\,e^2x^4\ln(c)-24ad\,e^2x^4+8a\,d^3-4b\,e^3x^6\ln(c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(b*ln(c*x^n)+a)/x^3,x)
```

```
[Out] -1/4*b*(-e^3*x^6-6*d*e^2*x^4-12*d^2*e*ln(x)*x^2+2*d^3)/x^2*ln(x^n)-1/16*(24
*I*ln(x)*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2-4*a*e^3*x^6-24*
b*d*e^2*x^4*ln(c)-24*a*d*e^2*x^4+8*a*d^3-4*b*e^3*x^6*ln(c)+4*b*d^3*n+8*b*d^
3*ln(c)+12*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+b*e^3*n*x^6
-48*ln(x)*a*d^2*e*x^2-4*I*Pi*b*d^3*csgn(I*c*x^n)^3-2*I*Pi*b*e^3*x^6*csgn(I*
c*x^n)^2*csgn(I*c)+12*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^3-4*I*Pi*b*d^3*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2-2
4*I*ln(x)*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^2-12*I*Pi*b*d*e^2*x^4*csgn
(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+2*I*P
i*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+24*I*ln(x)*Pi*b*d^2*e*csgn(
I*c*x^n)^3*x^2+2*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^3+4*I*Pi*b*d^3*csgn(I*c*x^n)^
2*csgn(I*c)+4*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-48*ln(x)*ln(c)*b*d^2*e
*x^2+24*b*d^2*e*n*ln(x)^2*x^2-24*I*ln(x)*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^
n)^2*x^2+12*b*d*e^2*n*x^4)/x^2
```

maxima [A] time = 0.49, size = 133, normalized size = 1.02

$$-\frac{1}{16}be^3nx^4+\frac{1}{4}be^3x^4\log\left(cx^n\right)+\frac{1}{4}ae^3x^4-\frac{3}{4}bde^2nx^2+\frac{3}{2}bde^2x^2\log\left(cx^n\right)+\frac{3}{2}ade^2x^2+\frac{3\,bd^2e\log\left(cx^n\right)^2}{2\,n}+3\,ad^2e\log($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] -1/16*b*e^3*n*x^4 + 1/4*b*e^3*x^4*log(c*x^n) + 1/4*a*e^3*x^4 - 3/4*b*d*e^2*
n*x^2 + 3/2*b*d*e^2*x^2*log(c*x^n) + 3/2*a*d*e^2*x^2 + 3/2*b*d^2*e*log(c*x^
n)^2/n + 3*a*d^2*e*log(x) - 1/4*b*d^3*n/x^2 - 1/2*b*d^3*log(c*x^n)/x^2 - 1/
2*a*d^3/x^2
```

mupad [B] time = 3.64, size = 163, normalized size = 1.24

$$\ln\left(c\,x^n\right)\left(\frac{\frac{3\,b\,e^3\,x^6}{4}+3\,b\,d\,e^2\,x^4}{x^2}-\frac{\frac{b\,d^3}{2}+\frac{3\,b\,d^2\,e\,x^2}{2}+\frac{3\,b\,d\,e^2\,x^4}{2}+\frac{b\,e^3\,x^6}{2}}{x^2}\right)-\frac{\frac{a\,d^3}{2}+\frac{b\,d^3\,n}{4}}{x^2}+\ln(x)\,\left(3\,a\,d^2\,e+\frac{3\,b\,d^2\,e\,n}{2}\right)+\frac{e^3\,x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^3*(a + b*log(c*x^n)))/x^3,x)
```

```
[Out] log(c*x^n)*(((3*b*e^3*x^6)/4 + 3*b*d*e^2*x^4)/x^2 - ((b*d^3)/2 + (b*e^3*x^6
)/2 + (3*b*d^2*e*x^2)/2 + (3*b*d*e^2*x^4)/2)/x^2) - ((a*d^3)/2 + (b*d^3*n)/
4)/x^2 + log(x)*(3*a*d^2*e + (3*b*d^2*e*n)/2) + (e^3*x^4*(4*a - b*n))/16 +
(3*d*e^2*x^2*(2*a - b*n))/4 + (3*b*d^2*e*log(c*x^n)^2)/(2*n)
```

sympy [A] time = 6.85, size = 209, normalized size = 1.60

$$-\frac{ad^3}{2x^2}+3ad^2e\log\left(x\right)+\frac{3ade^2x^2}{2}+\frac{ae^3x^4}{4}-\frac{bd^3n\log\left(x\right)}{2x^2}-\frac{bd^3n}{4x^2}-\frac{bd^3\log\left(c\right)}{2x^2}+\frac{3bd^2en\log\left(x\right)^2}{2}+3bd^2e\log\left(c\right)\log\left(x\right)+\frac{3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] -a*d**3/(2*x**2) + 3*a*d**2*e*log(x) + 3*a*d*e**2*x**2/2 + a*e**3*x**4/4 -
b*d**3*n*log(x)/(2*x**2) - b*d**3*n/(4*x**2) - b*d**3*log(c)/(2*x**2) + 3*b
*d**2*e*n*log(x)**2/2 + 3*b*d**2*e*log(c)*log(x) + 3*b*d*e**2*n*x**2*log(x)
/2 - 3*b*d*e**2*n*x**2/4 + 3*b*d*e**2*x**2*log(c)/2 + b*e**3*n*x**4*log(x)/
4 - b*e**3*n*x**4/16 + b*e**3*x**4*log(c)/4
```

3.201 $\int \frac{(d+ex^2)^3(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=131

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{2x^2}+3de^2\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}e^3x^2\left(a+b\log\left(cx^n\right)\right)-\frac{bd^3n}{16x^4}-\frac{3bd^2e}{4x^2}$$

```
[Out] -1/16*b*d^3*n/x^4-3/4*b*d^2*e*n/x^2-1/4*b*e^3*n*x^2-3/2*b*d*e^2*n*ln(x)^2-1
/4*d^3*(a+b*ln(c*x^n))/x^4-3/2*d^2*e*(a+b*ln(c*x^n))/x^2+1/2*e^3*x^2*(a+b*l
n(c*x^n))+3*d*e^2*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.12, antiderivative size = 99, normalized size of antiderivative = 0.76, number of steps used = 7, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$-\frac{1}{4}\left(\frac{6d^2e}{x^2}+\frac{d^3}{x^4}-12de^2\log(x)-2e^3x^2\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2en}{4x^2}-\frac{bd^3n}{16x^4}-\frac{3}{2}bde^2n\log^2(x)-\frac{1}{4}be^3nx^2$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d^3*n)/(16*x^4) - (3*b*d^2*e*n)/(4*x^2) - (b*e^3*n*x^2)/4 - (3*b*d*e^2*
n*Log[x]^2)/2 - ((d^3/x^4 + (6*d^2*e)/x^2 - 2*e^3*x^2 - 12*d*e^2*Log[x])*(a
 + b*Log[c*x^n]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
```

```
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{x^5}dx = -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-12de^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{-d^3-$$

$$= -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-12de^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(bn)\int\frac{-d^3}{}$$

$$= -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-12de^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(bn)\int\left(\frac{-d^3}{}\right.$$

$$= -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-12de^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(bn)\int\frac{-d^3}{}$$

$$= -\frac{3}{2}bde^2n\log^2(x)-\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-12de^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right.$$

$$= -\frac{bd^3n}{16x^4}-\frac{3bd^2en}{4x^2}-\frac{1}{4}be^3nx^2-\frac{3}{2}bde^2n\log^2(x)-\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-\right.$$

Mathematica [A] time = 0.09, size = 115, normalized size = 0.88

$$\frac{1}{16}\left(-\frac{4d^3\left(a+b\log\left(cx^n\right)\right)}{x^4}-\frac{24d^2e\left(a+b\log\left(cx^n\right)\right)}{x^2}+\frac{24de^2\left(a+b\log\left(cx^n\right)\right)^2}{bn}+8e^3x^2\left(a+b\log\left(cx^n\right)\right)-\frac{bd}{x}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] (-((b*d^3*n)/x^4) - (12*b*d^2*e*n)/x^2 - 4*b*e^3*n*x^2 - (4*d^3*(a + b*Log[
c*x^n]))/x^4 - (24*d^2*e*(a + b*Log[c*x^n]))/x^2 + 8*e^3*x^2*(a + b*Log[c*x
^n]) + (24*d*e^2*(a + b*Log[c*x^n])^2)/(b*n))/16
```

fricas [A] time = 0.82, size = 157, normalized size = 1.20

$$\frac{24\,bde^2nx^4\log(x)^2-4\left(be^3n-2\,ae^3\right)x^6-bd^3n-4\,ad^3-12\left(bd^2en+2\,ad^2e\right)x^2+4\left(2\,be^3x^6-6\,bd^2ex^2-bd^3\right)}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] 1/16*(24*b*d*e^2*n*x^4*log(x)^2 - 4*(b*e^3*n - 2*a*e^3)*x^6 - b*d^3*n - 4*a
*d^3 - 12*(b*d^2*e*n + 2*a*d^2*e)*x^2 + 4*(2*b*e^3*x^6 - 6*b*d^2*e*x^2 - b*
d^3)*log(c) + 4*(2*b*e^3*n*x^6 + 12*b*d*e^2*x^4*log(c) + 12*a*d*e^2*x^4 - 6
*b*d^2*e*n*x^2 - b*d^3*n)*log(x))/x^4
```

giac [A] time = 0.29, size = 162, normalized size = 1.24

$$\frac{8\,bnx^6e^3\log(x)+24\,bdnx^4e^2\log(x)^2-4\,bnx^6e^3+8\,bx^6e^3\log(c)+48\,bdx^4e^2\log(c)\log(x)+8\,ax^6e^3+48\,adx^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] 1/16*(8*b*n*x^6*e^3*log(x) + 24*b*d*n*x^4*e^2*log(x)^2 - 4*b*n*x^6*e^3 + 8*
b*x^6*e^3*log(c) + 48*b*d*x^4*e^2*log(c)*log(x) + 8*a*x^6*e^3 + 48*a*d*x^4*
e^2*log(x) - 24*b*d^2*n*x^2*e*log(x) - 12*b*d^2*n*x^2*e - 24*b*d^2*x^2*e*lo
g(c) - 24*a*d^2*x^2*e - 4*b*d^3*n*log(x) - b*d^3*n - 4*b*d^3*log(c) - 4*a*d
^3)/x^4
```

maple [C] time = 0.33, size = 602, normalized size = 4.60

$$-\frac{\left(-2e^3x^6-12d\,e^2x^4\ln(x)+6d^2e\,x^2+d^3\right)b\ln\left(x^n\right)}{4x^4}-\frac{-8a\,e^3x^6+4a\,d^3-8b\,e^3x^6\ln(c)+b\,d^3n+4b\,d^3\ln(c)+24a\,c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(b*ln(c*x^n)+a)/x^5,x)
```

```
[Out] -1/4*b*(-2*e^3*x^6-12*d*e^2*ln(x)*x^4+6*d^2*e*x^2+d^3)/x^4*ln(x^n)-1/16*(24
*I*ln(x)*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^4-8*a*e^3*x^6+4*a
*d^3-8*b*e^3*x^6*ln(c)+b*d^3*n+4*b*d^3*ln(c)+24*a*d^2*e*x^2+24*b*d^2*e*x^2*
ln(c)-2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*b*e^3*n*x^6-24*I*l
n(x)*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^4-24*I*ln(x)*Pi*b*d*e^2*csgn(
I*c*x^n)^2*csgn(I*c)*x^4-48*ln(x)*a*d*e^2*x^4-12*I*Pi*b*d^2*e*x^2*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*b*
e^3*x^6*csgn(I*c*x^n)^3+2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*d
^3*csgn(I*c*x^n)^3+12*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*b*e
^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+12*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*
csgn(I*c*x^n)^2+24*I*ln(x)*Pi*b*d*e^2*csgn(I*c*x^n)^3*x^4-48*ln(x)*ln(c)*b*
d*e^2*x^4+24*b*d*e^2*n*ln(x)^2*x^4-4*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^
n)^2-4*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*csgn(I*c)+12*b*d^2*e*n*x^2-12*I*Pi*b*
d^2*e*x^2*csgn(I*c*x^n)^3)/x^4
```

maxima [A] time = 0.50, size = 133, normalized size = 1.02

$$-\frac{1}{4}\,be^3nx^2+\frac{1}{2}\,be^3x^2\log\left(cx^n\right)+\frac{1}{2}\,ae^3x^2+\frac{3\,bde^2\log\left(cx^n\right)^2}{2\,n}+3\,ade^2\log(x)-\frac{3\,bd^2en}{4\,x^2}-\frac{3\,bd^2e\log\left(cx^n\right)}{2\,x^2}-\frac{3\,ad^2e}{2\,x^2}-\frac{bd^3n}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] -1/4*b*e^3*n*x^2 + 1/2*b*e^3*x^2*log(c*x^n) + 1/2*a*e^3*x^2 + 3/2*b*d*e^2*l
og(c*x^n)^2/n + 3*a*d*e^2*log(x) - 3/4*b*d^2*e*n/x^2 - 3/2*b*d^2*e*log(c*x^
n)/x^2 - 3/2*a*d^2*e/x^2 - 1/16*b*d^3*n/x^4 - 1/4*b*d^3*log(c*x^n)/x^4 - 1/
4*a*d^3/x^4
```

mupad [B] time = 3.66, size = 149, normalized size = 1.14

$$\ln(x)\,\left(3\,a\,d\,e^2+\frac{9\,b\,d\,e^2\,n}{4}\right)-\ln\left(c\,x^n\right)\,\left(\frac{\frac{b\,d^3}{4}+\frac{3\,b\,d^2\,e\,x^2}{2}+\frac{9\,b\,d\,e^2\,x^4}{4}+b\,e^3\,x^6}{x^4}-\frac{3\,b\,e^3\,x^2}{2}\right)-\frac{a\,d^3+x^2\,\left(6\,a\,d^2\,e+3\,b\,d^2\,e\right.}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^3*(a + b*log(c*x^n)))/x^5,x)
```

```
[Out] log(x)*(3*a*d*e^2 + (9*b*d*e^2*n)/4) - log(c*x^n)*(((b*d^3)/4 + b*e^3*x^6 +
 (3*b*d^2*e*x^2)/2 + (9*b*d*e^2*x^4)/4)/x^4 - (3*b*e^3*x^2)/2) - (a*d^3 + x
^2*(6*a*d^2*e + 3*b*d^2*e*n) + (b*d^3*n)/4)/(4*x^4) + (e^3*x^2*(2*a - b*n))
/4 + (3*b*d*e^2*log(c*x^n)^2)/(2*n)
```

sympy [A] time = 6.92, size = 209, normalized size = 1.60

$$-\frac{ad^3}{4x^4}-\frac{3ad^2e}{2x^2}+3ade^2\log(x)+\frac{ae^3x^2}{2}-\frac{bd^3n\log(x)}{4x^4}-\frac{bd^3n}{16x^4}-\frac{bd^3\log(c)}{4x^4}-\frac{3bd^2en\log(x)}{2x^2}-\frac{3bd^2en}{4x^2}-\frac{3bd^2e\log(c)}{2x^2}+\frac{3b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] -a*d**3/(4*x**4) - 3*a*d**2*e/(2*x**2) + 3*a*d*e**2*log(x) + a*e**3*x**2/2
- b*d**3*n*log(x)/(4*x**4) - b*d**3*n/(16*x**4) - b*d**3*log(c)/(4*x**4) -
3*b*d**2*e*n*log(x)/(2*x**2) - 3*b*d**2*e*n/(4*x**2) - 3*b*d**2*e*log(c)/(2
*x**2) + 3*b*d*e**2*n*log(x)**2/2 + 3*b*d*e**2*log(c)*log(x) + b*e**3*n*x**
2*log(x)/2 - b*e**3*n*x**2/4 + b*e**3*x**2*log(c)/2
```

3.202 $\int x^4 \left(d+ex^2\right)^3 \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=100

$$\frac{\left(231d^3x^5+495d^2ex^7+385de^2x^9+105e^3x^{11}\right)\left(a+b\log\left(cx^n\right)\right)}{1155}-\frac{1}{25}bd^3nx^5-\frac{3}{49}bd^2enx^7-\frac{1}{27}bde^2nx^9-\frac{1}{121}be^3nx^{11}$$

```
[Out] -1/25*b*d^3*n*x^5-3/49*b*d^2*e*n*x^7-1/27*b*d*e^2*n*x^9-1/121*b*e^3*n*x^11+
1/1155*(105*e^3*x^11+385*d*e^2*x^9+495*d^2*e*x^7+231*d^3*x^5)*(a+b*ln(c*x^n
))
```

Rubi [A] time = 0.09, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$\frac{\left(495d^2ex^7+231d^3x^5+385de^2x^9+105e^3x^{11}\right)\left(a+b\log\left(cx^n\right)\right)}{1155}-\frac{3}{49}bd^2enx^7-\frac{1}{25}bd^3nx^5-\frac{1}{27}bde^2nx^9-\frac{1}{121}be^3nx^{11}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^5)/25 - (3*b*d^2*e*n*x^7)/49 - (b*d*e^2*n*x^9)/27 - (b*e^3*n*x^
11)/121 + ((231*d^3*x^5 + 495*d^2*e*x^7 + 385*d*e^2*x^9 + 105*e^3*x^11)*(a
+ b*Log[c*x^n]))/1155
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] && !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^4\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)\,dx=\frac{\left(231d^3x^5+495d^2ex^7+385de^2x^9+105e^3x^{11}\right)\left(a+b\log\left(cx^n\right)\right)}{1155}-(bn)\int\Big($$

$$=-\frac{1}{25}bd^3nx^5-\frac{3}{49}bd^2enx^7-\frac{1}{27}bde^2nx^9-\frac{1}{121}be^3nx^{11}+\frac{\left(231d^3x^5+495d^2\right.}{}$$

Mathematica [A] time = 0.05, size = 133, normalized size = 1.33

$$\frac{1}{5}d^3x^5\left(a+b\log\left(cx^n\right)\right)+\frac{3}{7}d^2ex^7\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}de^2x^9\left(a+b\log\left(cx^n\right)\right)+\frac{1}{11}e^3x^{11}\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bd^3nx^5$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -1/25*(b*d^3*n*x^5) - (3*b*d^2*e*n*x^7)/49 - (b*d*e^2*n*x^9)/27 - (b*e^3*n*
x^11)/121 + (d^3*x^5*(a + b*Log[c*x^n]))/5 + (3*d^2*e*x^7*(a + b*Log[c*x^n]
))/7 + (d*e^2*x^9*(a + b*Log[c*x^n]))/3 + (e^3*x^11*(a + b*Log[c*x^n]))/11
```

fricas [A] time = 0.65, size = 167, normalized size = 1.67

$$-\frac{1}{121}\left(be^3n - 11\,ae^3\right)x^{11} - \frac{1}{27}\left(bde^2n - 9\,ade^2\right)x^9 - \frac{3}{49}\left(bd^2en - 7\,ad^2e\right)x^7 - \frac{1}{25}\left(bd^3n - 5\,ad^3\right)x^5 + \frac{1}{1155}\left(105\,be^3x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/121*(b*e^3*n - 11*a*e^3)*x^11 - 1/27*(b*d*e^2*n - 9*a*d*e^2)*x^9 - 3/49*
(b*d^2*e*n - 7*a*d^2*e)*x^7 - 1/25*(b*d^3*n - 5*a*d^3)*x^5 + 1/1155*(105*b*
e^3*x^11 + 385*b*d*e^2*x^9 + 495*b*d^2*e*x^7 + 231*b*d^3*x^5)*log(c) + 1/11
55*(105*b*e^3*n*x^11 + 385*b*d*e^2*n*x^9 + 495*b*d^2*e*n*x^7 + 231*b*d^3*n*
x^5)*log(x)
```

giac [A] time = 0.31, size = 173, normalized size = 1.73

$$\frac{1}{11}\,bnx^{11}e^3\log(x) - \frac{1}{121}\,bnx^{11}e^3 + \frac{1}{11}\,bx^{11}e^3\log(c) + \frac{1}{3}\,bdnx^9e^2\log(x) + \frac{1}{11}\,ax^{11}e^3 - \frac{1}{27}\,bdnx^9e^2 + \frac{1}{3}\,bdx^9e^2\log(c) +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/11*b*n*x^11*e^3*log(x) - 1/121*b*n*x^11*e^3 + 1/11*b*x^11*e^3*log(c) + 1/
3*b*d*n*x^9*e^2*log(x) + 1/11*a*x^11*e^3 - 1/27*b*d*n*x^9*e^2 + 1/3*b*d*x^9
*e^2*log(c) + 3/7*b*d^2*n*x^7*e*log(x) + 1/3*a*d*x^9*e^2 - 3/49*b*d^2*n*x^7
*e + 3/7*b*d^2*x^7*e*log(c) + 3/7*a*d^2*x^7*e + 1/5*b*d^3*n*x^5*log(x) - 1/
25*b*d^3*n*x^5 + 1/5*b*d^3*x^5*log(c) + 1/5*a*d^3*x^5
```

maple [C] time = 0.22, size = 602, normalized size = 6.02

$$\frac{ad\,e^2x^9}{3} + \frac{3a\,d^2e\,x^7}{7} + \frac{3b\,d^2e\,x^7\ln(c)}{7} + \frac{bd\,e^2x^9\ln(c)}{3} + \frac{a\,e^3x^{11}}{11} + \frac{a\,d^3x^5}{5} + \frac{b\,d^3x^5\ln(c)}{5} + \frac{b\,e^3x^{11}\ln(c)}{11} + \frac{\left(105e^3x^6 + 38\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/6*I*Pi*b*d*e^2*x^9*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*a*d*e^2*x^9+3/7*a*d^2*
e*x^7+3/7*ln(c)*b*d^2*e*x^7+1/3*ln(c)*b*d*e^2*x^9+1/11*a*e^3*x^11+1/5*a*d^3
*x^5+1/5*ln(c)*b*d^3*x^5+1/11*ln(c)*b*e^3*x^11-1/6*I*Pi*b*d*e^2*x^9*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+1/1155*b*x^5*(105*e^3*x^6+385*d*e^2*x^4+495*d^
2*e*x^2+231*d^3)*ln(x^n)-1/22*I*Pi*b*e^3*x^11*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)-3/14*I*Pi*b*d^2*e*x^7*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/22*I*Pi*
b*e^3*x^11*csgn(I*c*x^n)^3-1/10*I*Pi*b*d^3*x^5*csgn(I*c*x^n)^3-1/10*I*Pi*b*
d^3*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/25*b*d^3*n*x^5-1/121*b*e^3*n*
x^11+3/14*I*Pi*b*d^2*e*x^7*csgn(I*x^n)*csgn(I*c*x^n)^2+1/6*I*Pi*b*d*e^2*x^9
*csgn(I*c*x^n)^2*csgn(I*c)+3/14*I*Pi*b*d^2*e*x^7*csgn(I*c*x^n)^2*csgn(I*c)-
1/6*I*Pi*b*d*e^2*x^9*csgn(I*c*x^n)^3+1/22*I*Pi*b*e^3*x^11*csgn(I*x^n)*csgn(
I*c*x^n)^2+1/22*I*Pi*b*e^3*x^11*csgn(I*c*x^n)^2*csgn(I*c)-3/49*b*d^2*e*n*x^
7-1/27*b*d*e^2*n*x^9+1/10*I*Pi*b*d^3*x^5*csgn(I*c*x^n)^2*csgn(I*c)-3/14*I*P
i*b*d^2*e*x^7*csgn(I*c*x^n)^3+1/10*I*Pi*b*d^3*x^5*csgn(I*x^n)*csgn(I*c*x^n)
^2
```

maxima [A] time = 0.49, size = 143, normalized size = 1.43

$$-\frac{1}{121}\,be^3nx^{11} + \frac{1}{11}\,be^3x^{11}\log\left(cx^n\right) + \frac{1}{11}\,ae^3x^{11} - \frac{1}{27}\,bde^2nx^9 + \frac{1}{3}\,bde^2x^9\log\left(cx^n\right) + \frac{1}{3}\,ade^2x^9 - \frac{3}{49}\,bd^2enx^7 + \frac{3}{7}\,bd^2e$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/121*b*e^3*n*x^11 + 1/11*b*e^3*x^11*log(c*x^n) + 1/11*a*e^3*x^11 - 1/27*b
*d*e^2*n*x^9 + 1/3*b*d*e^2*x^9*log(c*x^n) + 1/3*a*d*e^2*x^9 - 3/49*b*d^2*e*
n*x^7 + 3/7*b*d^2*e*x^7*log(c*x^n) + 3/7*a*d^2*e*x^7 - 1/25*b*d^3*n*x^5 + 1
/5*b*d^3*x^5*log(c*x^n) + 1/5*a*d^3*x^5
```

mupad [B] time = 3.73, size = 113, normalized size = 1.13

$$\ln\left(c\,x^n\right)\,\left(\frac{b\,d^3\,x^5}{5}+\frac{3\,b\,d^2\,e\,x^7}{7}+\frac{b\,d\,e^2\,x^9}{3}+\frac{b\,e^3\,x^{11}}{11}\right)+\frac{d^3\,x^5\,\left(5\,a-b\,n\right)}{25}+\frac{e^3\,x^{11}\,\left(11\,a-b\,n\right)}{121}+\frac{3\,d^2\,e\,x^7\,\left(7\,a-b\,n\right)}{49}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d + e*x^2)^3*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d^3*x^5)/5 + (b*e^3*x^11)/11 + (3*b*d^2*e*x^7)/7 + (b*d*e^2*
x^9)/3) + (d^3*x^5*(5*a - b*n))/25 + (e^3*x^11*(11*a - b*n))/121 + (3*d^2*e
*x^7*(7*a - b*n))/49 + (d*e^2*x^9*(9*a - b*n))/27
```

sympy [B] time = 32.87, size = 223, normalized size = 2.23

$$\frac{ad^3x^5}{5}+\frac{3ad^2ex^7}{7}+\frac{ade^2x^9}{3}+\frac{ae^3x^{11}}{11}+\frac{bd^3nx^5\log\left(x\right)}{5}-\frac{bd^3nx^5}{25}+\frac{bd^3x^5\log\left(c\right)}{5}+\frac{3bd^2enx^7\log\left(x\right)}{7}-\frac{3bd^2enx^7}{49}+\frac{3bd^2ex}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**5/5 + 3*a*d**2*e*x**7/7 + a*d*e**2*x**9/3 + a*e**3*x**11/11 + b*d
**3*n*x**5*log(x)/5 - b*d**3*n*x**5/25 + b*d**3*x**5*log(c)/5 + 3*b*d**2*e*
n*x**7*log(x)/7 - 3*b*d**2*e*n*x**7/49 + 3*b*d**2*e*x**7*log(c)/7 + b*d*e**
2*n*x**9*log(x)/3 - b*d*e**2*n*x**9/27 + b*d*e**2*x**9*log(c)/3 + b*e**3*n*
x**11*log(x)/11 - b*e**3*n*x**11/121 + b*e**3*x**11*log(c)/11
```

3.203 $\int x^2 \left(d+ex^2\right)^3 \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=100

$$\frac{1}{315}\left(105d^3x^3+189d^2ex^5+135de^2x^7+35e^3x^9\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bd^3nx^3-\frac{3}{25}bd^2enx^5-\frac{3}{49}bde^2nx^7-\frac{1}{81}be^3nx$$

```
[Out] -1/9*b*d^3*n*x^3-3/25*b*d^2*e*n*x^5-3/49*b*d*e^2*n*x^7-1/81*b*e^3*n*x^9+1/3
15*(35*e^3*x^9+135*d*e^2*x^7+189*d^2*e*x^5+105*d^3*x^3)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.09, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$\frac{1}{315}\left(189d^2ex^5+105d^3x^3+135de^2x^7+35e^3x^9\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3}{25}bd^2enx^5-\frac{1}{9}bd^3nx^3-\frac{3}{49}bde^2nx^7-\frac{1}{81}be^3nx$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^3)/9 - (3*b*d^2*e*n*x^5)/25 - (3*b*d*e^2*n*x^7)/49 - (b*e^3*n*x
^9)/81 + ((105*d^3*x^3 + 189*d^2*e*x^5 + 135*d*e^2*x^7 + 35*e^3*x^9)*(a + b
*Log[c*x^n]))/315
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] && !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int x^2\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{315}\left(105d^3x^3+189d^2ex^5+135de^2x^7+35e^3x^9\right)\left(a+b\log\left(cx^n\right)\right)-(bn\\ &= -\frac{1}{9}bd^3nx^3-\frac{3}{25}bd^2enx^5-\frac{3}{49}bde^2nx^7-\frac{1}{81}be^3nx^9+\frac{1}{315}\left(105d^3x^3+18\right.\end{aligned}$$

Mathematica [A] time = 0.05, size = 133, normalized size = 1.33

$$\frac{1}{3}d^3x^3\left(a+b\log\left(cx^n\right)\right)+\frac{3}{5}d^2ex^5\left(a+b\log\left(cx^n\right)\right)+\frac{3}{7}de^2x^7\left(a+b\log\left(cx^n\right)\right)+\frac{1}{9}e^3x^9\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bd^3nx^3$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -1/9*(b*d^3*n*x^3) - (3*b*d^2*e*n*x^5)/25 - (3*b*d*e^2*n*x^7)/49 - (b*e^3*n
*x^9)/81 + (d^3*x^3*(a + b*Log[c*x^n]))/3 + (3*d^2*e*x^5*(a + b*Log[c*x^n])
)/5 + (3*d*e^2*x^7*(a + b*Log[c*x^n]))/7 + (e^3*x^9*(a + b*Log[c*x^n]))/9
```

fricas [A] time = 0.87, size = 167, normalized size = 1.67

$$-\frac{1}{81}\left(be^3n - 9\,ae^3\right)x^9 - \frac{3}{49}\left(bde^2n - 7\,ade^2\right)x^7 - \frac{3}{25}\left(bd^2en - 5\,ad^2e\right)x^5 - \frac{1}{9}\left(bd^3n - 3\,ad^3\right)x^3 + \frac{1}{315}\left(35\,be^3x^9 + 135\,bc\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/81*(b*e^3*n - 9*a*e^3)*x^9 - 3/49*(b*d*e^2*n - 7*a*d*e^2)*x^7 - 3/25*(b*
d^2*e*n - 5*a*d^2*e)*x^5 - 1/9*(b*d^3*n - 3*a*d^3)*x^3 + 1/315*(35*b*e^3*x^
9 + 135*b*d*e^2*x^7 + 189*b*d^2*e*x^5 + 105*b*d^3*x^3)*log(c) + 1/315*(35*b
*e^3*n*x^9 + 135*b*d*e^2*n*x^7 + 189*b*d^2*e*n*x^5 + 105*b*d^3*n*x^3)*log(x
)
```

giac [A] time = 0.32, size = 173, normalized size = 1.73

$$\frac{1}{9}\,bnx^9e^3\log(x) - \frac{1}{81}\,bnx^9e^3 + \frac{1}{9}\,bx^9e^3\log(c) + \frac{3}{7}\,bdnx^7e^2\log(x) + \frac{1}{9}\,ax^9e^3 - \frac{3}{49}\,bdnx^7e^2 + \frac{3}{7}\,bdx^7e^2\log(c) + \frac{3}{5}\,bd^2nx^5e$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/9*b*n*x^9*e^3*log(x) - 1/81*b*n*x^9*e^3 + 1/9*b*x^9*e^3*log(c) + 3/7*b*d*
n*x^7*e^2*log(x) + 1/9*a*x^9*e^3 - 3/49*b*d*n*x^7*e^2 + 3/7*b*d*x^7*e^2*log
(c) + 3/5*b*d^2*n*x^5*e*log(x) + 3/7*a*d*x^7*e^2 - 3/25*b*d^2*n*x^5*e + 3/5
*b*d^2*x^5*e*log(c) + 3/5*a*d^2*x^5*e + 1/3*b*d^3*n*x^3*log(x) - 1/9*b*d^3*
n*x^3 + 1/3*b*d^3*x^3*log(c) + 1/3*a*d^3*x^3
```

maple [C] time = 0.22, size = 602, normalized size = 6.02

$$\frac{a\,d^3x^3}{3} + \frac{3a\,d^2e\,x^5}{5} + \frac{3ad\,e^2x^7}{7} + \frac{3b\,d^2e\,x^5\ln(c)}{5} + \frac{3bd\,e^2x^7\ln(c)}{7} + \frac{a\,e^3x^9}{9} + \frac{b\,d^3x^3\ln(c)}{3} + \frac{b\,e^3x^9\ln(c)}{9} + \frac{\left(35e^3x^6 + 135d\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/3*a*d^3*x^3+3/5*a*d^2*e*x^5+3/7*a*d*e^2*x^7+3/5*b*d^2*e*x^5*ln(c)+3/7*ln(
c)*b*d*e^2*x^7+1/9*a*e^3*x^9+1/3*b*d^3*x^3*ln(c)+1/9*ln(c)*b*e^3*x^9+1/315*
b*x^3*(35*e^3*x^6+135*d*e^2*x^4+189*d^2*e*x^2+105*d^3)*ln(x^n)+3/14*I*Pi*b*
d*e^2*x^7*csgn(I*x^n)*csgn(I*c*x^n)^2-1/9*b*d^3*n*x^3-3/10*I*Pi*b*d^2*e*x^5
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/14*I*Pi*b*d*e^2*x^7*csgn(I*c*x^n)^2*
csgn(I*c)-1/6*I*Pi*b*d^3*x^3*csgn(I*c*x^n)^3-1/18*I*Pi*b*e^3*x^9*csgn(I*c*x
^n)^3-3/14*I*Pi*b*d*e^2*x^7*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/81*b*e^3*
n*x^9-1/6*I*Pi*b*d^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/10*I*Pi*b*d^
2*e*x^5*csgn(I*c*x^n)^2*csgn(I*c)-1/18*I*Pi*b*e^3*x^9*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)+3/10*I*Pi*b*d^2*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2-3/10*I*Pi*
b*d^2*e*x^5*csgn(I*c*x^n)^3+1/6*I*Pi*b*d^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+
1/6*I*Pi*b*d^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/18*I*Pi*b*e^3*x^9*csgn(I*c*x
^n)^2*csgn(I*c)-3/49*b*d*e^2*n*x^7-3/14*I*Pi*b*d*e^2*x^7*csgn(I*c*x^n)^3+1/
18*I*Pi*b*e^3*x^9*csgn(I*x^n)*csgn(I*c*x^n)^2-3/25*b*d^2*e*n*x^5
```

maxima [A] time = 0.54, size = 143, normalized size = 1.43

$$-\frac{1}{81}\,be^3nx^9 + \frac{1}{9}\,be^3x^9\log\left(cx^n\right) + \frac{1}{9}\,ae^3x^9 - \frac{3}{49}\,bde^2nx^7 + \frac{3}{7}\,bde^2x^7\log\left(cx^n\right) + \frac{3}{7}\,ade^2x^7 - \frac{3}{25}\,bd^2enx^5 + \frac{3}{5}\,bd^2ex^5\log\left(cx\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/81*b*e^3*n*x^9 + 1/9*b*e^3*x^9*log(c*x^n) + 1/9*a*e^3*x^9 - 3/49*b*d*e^2
*n*x^7 + 3/7*b*d*e^2*x^7*log(c*x^n) + 3/7*a*d*e^2*x^7 - 3/25*b*d^2*e*n*x^5
+ 3/5*b*d^2*e*x^5*log(c*x^n) + 3/5*a*d^2*e*x^5 - 1/9*b*d^3*n*x^3 + 1/3*b*d^
3*x^3*log(c*x^n) + 1/3*a*d^3*x^3
```

mupad [B] time = 3.63, size = 113, normalized size = 1.13

$$\ln(c\,x^n)\left(\frac{b\,d^3\,x^3}{3}+\frac{3\,b\,d^2\,e\,x^5}{5}+\frac{3\,b\,d\,e^2\,x^7}{7}+\frac{b\,e^3\,x^9}{9}\right)+\frac{d^3\,x^3\,\left(3\,a-b\,n\right)}{9}+\frac{e^3\,x^9\,\left(9\,a-b\,n\right)}{81}+\frac{3\,d^2\,e\,x^5\,\left(5\,a-b\,n\right)}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d + e*x^2)^3*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*d^3*x^3)/3 + (b*e^3*x^9)/9 + (3*b*d^2*e*x^5)/5 + (3*b*d*e^2*
x^7)/7) + (d^3*x^3*(3*a - b*n))/9 + (e^3*x^9*(9*a - b*n))/81 + (3*d^2*e*x^5
*(5*a - b*n))/25 + (3*d*e^2*x^7*(7*a - b*n))/49
```

sympy [B] time = 15.40, size = 230, normalized size = 2.30

$$\frac{ad^3x^3}{3}+\frac{3ad^2ex^5}{5}+\frac{3ade^2x^7}{7}+\frac{ae^3x^9}{9}+\frac{bd^3nx^3\log(x)}{3}-\frac{bd^3nx^3}{9}+\frac{bd^3x^3\log(c)}{3}+\frac{3bd^2enx^5\log(x)}{5}-\frac{3bd^2enx^5}{25}+\frac{3bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**3/3 + 3*a*d**2*e*x**5/5 + 3*a*d*e**2*x**7/7 + a*e**3*x**9/9 + b*d
**3*n*x**3*log(x)/3 - b*d**3*n*x**3/9 + b*d**3*x**3*log(c)/3 + 3*b*d**2*e*n
*x**5*log(x)/5 - 3*b*d**2*e*n*x**5/25 + 3*b*d**2*e*x**5*log(c)/5 + 3*b*d*e*
*2*n*x**7*log(x)/7 - 3*b*d*e**2*n*x**7/49 + 3*b*d*e**2*x**7*log(c)/7 + b*e*
*3*n*x**9*log(x)/9 - b*e**3*n*x**9/81 + b*e**3*x**9*log(c)/9
```

3.204 $\int \left(d+ex^2\right)^3 \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=121

$$d^3x\left(a+b\log\left(cx^n\right)\right)+d^2ex^3\left(a+b\log\left(cx^n\right)\right)+\frac{3}{5}de^2x^5\left(a+b\log\left(cx^n\right)\right)+\frac{1}{7}e^3x^7\left(a+b\log\left(cx^n\right)\right)-bd^3nx-\frac{1}{3}bd^2enx$$

```
[Out] -b*d^3*n*x-1/3*b*d^2*e*n*x^3-3/25*b*d*e^2*n*x^5-1/49*b*e^3*n*x^7+d^3*x*(a+b
*ln(c*x^n))+d^2*e*x^3*(a+b*ln(c*x^n))+3/5*d*e^2*x^5*(a+b*ln(c*x^n))+1/7*e^3
*x^7*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.05, antiderivative size = 94, normalized size of antiderivative = 0.78, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {194, 2313}

$$\frac{1}{35}\left(35d^2ex^3+35d^3x+21de^2x^5+5e^3x^7\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}bd^2enx^3-bd^3nx-\frac{3}{25}bde^2nx^5-\frac{1}{49}be^3nx^7$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x) - (b*d^2*e*n*x^3)/3 - (3*b*d*e^2*n*x^5)/25 - (b*e^3*n*x^7)/49
+ ((35*d^3*x + 35*d^2*e*x^3 + 21*d*e^2*x^5 + 5*e^3*x^7)*(a + b*Log[c*x^n]))
/35
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\begin{aligned}\int \left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)dx &= \frac{1}{35}\left(35d^3x+35d^2ex^3+21de^2x^5+5e^3x^7\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(d^3+d^2\right.\\ &= -bd^3nx-\frac{1}{3}bd^2enx^3-\frac{3}{25}bde^2nx^5-\frac{1}{49}be^3nx^7+\frac{1}{35}\left(35d^3x+35d^2ex^3+21d\right.\end{aligned}$$

Mathematica [A] time = 0.05, size = 124, normalized size = 1.02

$$d^2ex^3\left(a+b\log\left(cx^n\right)\right)+\frac{3}{5}de^2x^5\left(a+b\log\left(cx^n\right)\right)+\frac{1}{7}e^3x^7\left(a+b\log\left(cx^n\right)\right)+ad^3x+bd^3x\log\left(cx^n\right)-bd^3nx-\frac{1}{3}bd^2enx$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] a*d^3*x - b*d^3*n*x - (b*d^2*e*n*x^3)/3 - (3*b*d*e^2*n*x^5)/25 - (b*e^3*n*x
^7)/49 + b*d^3*x*Log[c*x^n] + d^2*e*x^3*(a + b*Log[c*x^n]) + (3*d*e^2*x^5*(
a + b*Log[c*x^n]))/5 + (e^3*x^7*(a + b*Log[c*x^n]))/7
```

fricas [A] time = 0.72, size = 161, normalized size = 1.33

$$-\frac{1}{49}\left(be^3n-7\,ae^3\right)x^7-\frac{3}{25}\left(bde^2n-5\,ade^2\right)x^5-\frac{1}{3}\left(bd^2en-3\,ad^2e\right)x^3-\left(bd^3n-ad^3\right)x+\frac{1}{35}\left(5\,be^3x^7+21\,bde^2x^5+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/49*(b*e^3*n - 7*a*e^3)*x^7 - 3/25*(b*d*e^2*n - 5*a*d*e^2)*x^5 - 1/3*(b*d
^2*e*n - 3*a*d^2*e)*x^3 - (b*d^3*n - a*d^3)*x + 1/35*(5*b*e^3*x^7 + 21*b*d*
e^2*x^5 + 35*b*d^2*e*x^3 + 35*b*d^3*x)*log(c) + 1/35*(5*b*e^3*n*x^7 + 21*b*
d*e^2*n*x^5 + 35*b*d^2*e*n*x^3 + 35*b*d^3*n*x)*log(x)
```

giac [A] time = 0.32, size = 159, normalized size = 1.31

$$\frac{1}{7}\,bnx^7e^3\log(x)-\frac{1}{49}\,bnx^7e^3+\frac{1}{7}\,bx^7e^3\log(c)+\frac{3}{5}\,bdnx^5e^2\log(x)+\frac{1}{7}\,ax^7e^3-\frac{3}{25}\,bdnx^5e^2+\frac{3}{5}\,bdx^5e^2\log(c)+bd^2nx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/7*b*n*x^7*e^3*log(x) - 1/49*b*n*x^7*e^3 + 1/7*b*x^7*e^3*log(c) + 3/5*b*d*
n*x^5*e^2*log(x) + 1/7*a*x^7*e^3 - 3/25*b*d*n*x^5*e^2 + 3/5*b*d*x^5*e^2*log
(c) + b*d^2*n*x^3*e*log(x) + 3/5*a*d*x^5*e^2 - 1/3*b*d^2*n*x^3*e + b*d^2*x^
3*e*log(c) + a*d^2*x^3*e + b*d^3*n*x*log(x) - b*d^3*n*x + b*d^3*x*log(c) +
a*d^3*x
```

maple [C] time = 0.22, size = 582, normalized size = 4.81

$$b\,d^2e\,x^3\ln(c)+\frac{3ad\,e^2x^5}{5}+a\,d^2e\,x^3+\frac{3bd\,e^2x^5\ln(c)}{5}+a\,d^3x+\frac{a\,e^3x^7}{7}+\frac{b\,e^3x^7\ln(c)}{7}+b\,d^3x\ln(c)+\frac{\left(5e^3x^6+21d\,e^2x^4+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/2*I*Pi*b*d^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+b*d^2*e*x^3*ln(c)+3/5*a*d*
e^2*x^5+a*d^2*e*x^3+3/5*b*d*e^2*x^5*ln(c)+3/10*I*Pi*b*d*e^2*x^5*csgn(I*x^n)
*csgn(I*c*x^n)^2+3/10*I*Pi*b*d*e^2*x^5*csgn(I*c*x^n)^2*csgn(I*c)+a*d^3*x+1/
7*a*e^3*x^7+1/7*b*e^3*x^7*ln(c)+ln(c)*b*d^3*x+1/35*b*x*(5*e^3*x^6+21*d*e^2*
x^4+35*d^2*e*x^2+35*d^3)*ln(x^n)+1/2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2
*x-1/2*I*Pi*b*d^2*e*x^3*csgn(I*c*x^n)^3-3/10*I*Pi*b*d*e^2*x^5*csgn(I*c*x^n)
^3-1/49*b*e^3*n*x^7+1/2*I*Pi*b*d^2*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/14*I*P
i*b*e^3*x^7*csgn(I*c*x^n)^3-1/2*I*Pi*b*d^3*csgn(I*c*x^n)^3*x-3/10*I*Pi*b*d*
e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*b*d^2*e*x^3*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*x-1/14*I*Pi*b*e^3*x^7*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*Pi*b*d^3*
csgn(I*c*x^n)^2*csgn(I*c)*x+1/14*I*Pi*b*e^3*x^7*csgn(I*x^n)*csgn(I*c*x^n)^2
+1/14*I*Pi*b*e^3*x^7*csgn(I*c*x^n)^2*csgn(I*c)-b*d^3*n*x-3/25*b*d*e^2*n*x^5
-1/3*b*d^2*e*n*x^3
```

maxima [A] time = 0.46, size = 133, normalized size = 1.10

$$-\frac{1}{49}\,be^3nx^7+\frac{1}{7}\,be^3x^7\log\left(cx^n\right)+\frac{1}{7}\,ae^3x^7-\frac{3}{25}\,bde^2nx^5+\frac{3}{5}\,bde^2x^5\log\left(cx^n\right)+\frac{3}{5}\,ade^2x^5-\frac{1}{3}\,bd^2enx^3+bd^2ex^3\log\left(cx\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/49*b*e^3*n*x^7 + 1/7*b*e^3*x^7*log(c*x^n) + 1/7*a*e^3*x^7 - 3/25*b*d*e^2
*n*x^5 + 3/5*b*d*e^2*x^5*log(c*x^n) + 3/5*a*d*e^2*x^5 - 1/3*b*d^2*e*n*x^3 +
```

b*d^2*e*x^3*log(c*x^n) + a*d^2*e*x^3 - b*d^3*n*x + b*d^3*x*log(c*x^n) + a*
d^3*x

mupad [B] time = 3.72, size = 104, normalized size = 0.86

$$\ln(c\,x^n)\,\left(b\,d^3\,x+b\,d^2\,e\,x^3+\frac{3\,b\,d\,e^2\,x^5}{5}+\frac{b\,e^3\,x^7}{7}\right)+\frac{e^3\,x^7\,\left(7\,a-b\,n\right)}{49}+d^3\,x\,\left(a-b\,n\right)+\frac{d^2\,e\,x^3\,\left(3\,a-b\,n\right)}{3}+\frac{3\,d\,e^2\,x^5\,(}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)^3*(a + b*log(c*x^n)),x)
```

```
[Out] log(c*x^n)*((b*e^3*x^7)/7 + b*d^3*x + b*d^2*e*x^3 + (3*b*d*e^2*x^5)/5) + (e
^3*x^7*(7*a - b*n))/49 + d^3*x*(a - b*n) + (d^2*e*x^3*(3*a - b*n))/3 + (3*d
*e^2*x^5*(5*a - b*n))/25
```

sympy [A] time = 6.60, size = 204, normalized size = 1.69

$$ad^3x+ad^2ex^3+\frac{3ade^2x^5}{5}+\frac{ae^3x^7}{7}+bd^3nx\log(x)-bd^3nx+bd^3x\log(c)+bd^2enx^3\log(x)-\frac{bd^2enx^3}{3}+bd^2ex^3\log(c)+\frac{3b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x + a*d**2*e*x**3 + 3*a*d*e**2*x**5/5 + a*e**3*x**7/7 + b*d**3*n*x*l
og(x) - b*d**3*n*x + b*d**3*x*log(c) + b*d**2*e*n*x**3*log(x) - b*d**2*e*n*
x**3/3 + b*d**2*e*x**3*log(c) + 3*b*d*e**2*n*x**5*log(x)/5 - 3*b*d*e**2*n*x
**5/25 + 3*b*d*e**2*x**5*log(c)/5 + b*e**3*n*x**7*log(x)/7 - b*e**3*n*x**7/
49 + b*e**3*x**7*log(c)/7
```

3.205 $\int \frac{(d+ex^2)^3 (a+b\log(cx^n))}{x^2} dx$

Optimal. Leaf size=118

$$-\frac{d^3(a+b\log(cx^n))}{x}+3d^2ex(a+b\log(cx^n))+de^2x^3(a+b\log(cx^n))+\frac{1}{5}e^3x^5(a+b\log(cx^n))-\frac{bd^3n}{x}-3bd^2en$$

```
[Out] -b*d^3*n/x-3*b*d^2*e*n*x-1/3*b*d*e^2*n*x^3-1/25*b*e^3*n*x^5-d^3*(a+b*ln(c*x
^n))/x+3*d^2*e*x*(a+b*ln(c*x^n))+d*e^2*x^3*(a+b*ln(c*x^n))+1/5*e^3*x^5*(a+b
*ln(c*x^n))
```

Rubi [A] time = 0.08, antiderivative size = 92, normalized size of antiderivative = 0.78, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$-\frac{1}{5}\left(-15d^2ex+\frac{5d^3}{x}-5de^2x^3-e^3x^5\right)(a+b\log(cx^n))-3bd^2enx-\frac{bd^3n}{x}-\frac{1}{3}bde^2nx^3-\frac{1}{25}be^3nx^5$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^3*n)/x) - 3*b*d^2*e*n*x - (b*d*e^2*n*x^3)/3 - (b*e^3*n*x^5)/25 - (((
5*d^3)/x - 15*d^2*e*x - 5*d*e^2*x^3 - e^3*x^5)*(a + b*Log[c*x^n]))/5
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^2)^3(a+b\log(cx^n))}{x^2}dx = -\frac{1}{5}\left(\frac{5d^3}{x}-15d^2ex-5de^2x^3-e^3x^5\right)(a+b\log(cx^n))-(bn)\int\left(3d^2e-\frac{d^3}{x^2}\right.$$

$$= -\frac{bd^3n}{x}-3bd^2enx-\frac{1}{3}bde^2nx^3-\frac{1}{25}be^3nx^5-\frac{1}{5}\left(\frac{5d^3}{x}-15d^2ex-5de^2x^3-\right.$$

Mathematica [A] time = 0.06, size = 123, normalized size = 1.04

$$-\frac{d^3(a+b\log(cx^n))}{x}+de^2x^3(a+b\log(cx^n))+\frac{1}{5}e^3x^5(a+b\log(cx^n))+3ad^2ex+3bd^2ex\log(cx^n)-\frac{bd^3n}{x}-3bd^2e$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^3*n)/x) + 3*a*d^2*e*x - 3*b*d^2*e*n*x - (b*d*e^2*n*x^3)/3 - (b*e^3*n
*x^5)/25 + 3*b*d^2*e*x*Log[c*x^n] - (d^3*(a + b*Log[c*x^n]))/x + d*e^2*x^3*
(a + b*Log[c*x^n]) + (e^3*x^5*(a + b*Log[c*x^n]))/5
```

fricas [A] time = 0.60, size = 159, normalized size = 1.35

$$-\frac{3\left(be^3n-5\,ae^3\right)x^6+75\,bd^3n+25\left(bde^2n-3\,ade^2\right)x^4+75\,ad^3+225\left(bd^2en-ad^2e\right)x^2-15\left(be^3x^6+5\,bde^2x^4+\right.}{75\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -1/75*(3*(b*e^3*n - 5*a*e^3)*x^6 + 75*b*d^3*n + 25*(b*d*e^2*n - 3*a*d*e^2)*
x^4 + 75*a*d^3 + 225*(b*d^2*e*n - a*d^2*e)*x^2 - 15*(b*e^3*x^6 + 5*b*d*e^2*
x^4 + 15*b*d^2*e*x^2 - 5*b*d^3)*log(c) - 15*(b*e^3*n*x^6 + 5*b*d*e^2*n*x^4
+ 15*b*d^2*e*n*x^2 - 5*b*d^3*n)*log(x))/x
```

giac [A] time = 0.42, size = 166, normalized size = 1.41

$$\frac{15\,bnx^6e^3\log(x)-3\,bnx^6e^3+15\,bx^6e^3\log(c)+75\,bdnx^4e^2\log(x)+15\,ax^6e^3-25\,bdnx^4e^2+75\,bdx^4e^2\log(c)+2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] 1/75*(15*b*n*x^6*e^3*log(x) - 3*b*n*x^6*e^3 + 15*b*x^6*e^3*log(c) + 75*b*d*
n*x^4*e^2*log(x) + 15*a*x^6*e^3 - 25*b*d*n*x^4*e^2 + 75*b*d*x^4*e^2*log(c)
+ 225*b*d^2*n*x^2*e*log(x) + 75*a*d*x^4*e^2 - 225*b*d^2*n*x^2*e + 225*b*d^2
*x^2*e*log(c) + 225*a*d^2*x^2*e - 75*b*d^3*n*log(x) - 75*b*d^3*n - 75*b*d^3
*log(c) - 75*a*d^3)/x
```

maple [C] time = 0.24, size = 587, normalized size = 4.97

$$-\frac{\left(-e^3x^6-5d\,e^2x^4-15d^2e\,x^2+5d^3\right)b\ln\left(x^n\right)}{5x}-\frac{-30a\,e^3x^6-150bd\,e^2x^4\ln(c)-150ad\,e^2x^4+150a\,d^3-30b\,e^3x^6\ln}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(b*ln(c*x^n)+a)/x^2,x)
```

```
[Out] -1/5*b*(-e^3*x^6-5*d*e^2*x^4-15*d^2*e*x^2+5*d^3)/x*ln(x^n)-1/150*(-75*I*Pi*
b*d^3*csgn(I*c*x^n)^3-30*a*e^3*x^6-150*b*d*e^2*x^4*ln(c)-150*a*d*e^2*x^4+15
0*a*d^3-30*b*e^3*x^6*ln(c)+150*b*d^3*n+150*b*d^3*ln(c)-450*a*d^2*e*x^2+225*
I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+75*I*Pi*b*d*e^2*x^4*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-450*b*d^2*e*x^2*ln(c)+6*b*e^3*n*x^6+75*I*
Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+15*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^3+75*I*P
i*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-225*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I
*c*x^n)^2-75*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-15*I*Pi*b*e^3*x^6
*csgn(I*x^n)*csgn(I*c*x^n)^2-15*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*csgn(I*c)-75
*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+15*I*Pi*b*e^3*x^6*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)-225*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+75*I*
Pi*b*d*e^2*x^4*csgn(I*c*x^n)^3+225*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^3-75*I*Pi
*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+50*b*d*e^2*n*x^4+450*b*d^2*e*n*x
^2)/x
```

maxima [A] time = 0.52, size = 135, normalized size = 1.14

$$-\frac{1}{25}\,be^3nx^5+\frac{1}{5}\,be^3x^5\log\left(cx^n\right)+\frac{1}{5}\,ae^3x^5-\frac{1}{3}\,bde^2nx^3+bde^2x^3\log\left(cx^n\right)+ade^2x^3-3\,bd^2enx+3\,bd^2ex\log\left(cx^n\right)+3\,ad^2e$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] -1/25*b*e^3*n*x^5 + 1/5*b*e^3*x^5*log(c*x^n) + 1/5*a*e^3*x^5 - 1/3*b*d*e^2*
n*x^3 + b*d*e^2*x^3*log(c*x^n) + a*d*e^2*x^3 - 3*b*d^2*e*n*x + 3*b*d^2*e*x*
log(c*x^n) + 3*a*d^2*e*x - b*d^3*n/x - b*d^3*log(c*x^n)/x - a*d^3/x
```

mupad [B] time = 3.52, size = 145, normalized size = 1.23

$$\ln(c\,x^n)\left(\frac{6\,b\,d^2\,e\,x^2+4\,b\,d\,e^2\,x^4+\frac{6\,b\,e^3\,x^6}{5}}{x}-\frac{b\,d^3+3\,b\,d^2\,e\,x^2+3\,b\,d\,e^2\,x^4+b\,e^3\,x^6}{x}\right)-\frac{a\,d^3+b\,d^3\,n}{x}+\frac{e^3\,x^5\,(5\,a-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^3*(a + b*log(c*x^n)))/x^2,x)
```

```
[Out] log(c*x^n)*(((6*b*e^3*x^6)/5 + 6*b*d^2*e*x^2 + 4*b*d*e^2*x^4)/x - (b*d^3 +
b*e^3*x^6 + 3*b*d^2*e*x^2 + 3*b*d*e^2*x^4)/x) - (a*d^3 + b*d^3*n)/x + (e^3*
x^5*(5*a - b*n))/25 + (d*e^2*x^3*(3*a - b*n))/3 + 3*d^2*e*x*(a - b*n)
```

sympy [A] time = 6.77, size = 190, normalized size = 1.61

$$-\frac{ad^3}{x}+3ad^2ex+ade^2x^3+\frac{ae^3x^5}{5}-\frac{bd^3n\log(x)}{x}-\frac{bd^3n}{x}-\frac{bd^3\log(c)}{x}+3bd^2enx\log(x)-3bd^2enx+3bd^2ex\log(c)+bd$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] -a*d**3/x + 3*a*d**2*e*x + a*d*e**2*x**3 + a*e**3*x**5/5 - b*d**3*n*log(x)/
x - b*d**3*n/x - b*d**3*log(c)/x + 3*b*d**2*e*n*x*log(x) - 3*b*d**2*e*n*x +
 3*b*d**2*e*x*log(c) + b*d*e**2*n*x**3*log(x) - b*d*e**2*n*x**3/3 + b*d*e**
2*x**3*log(c) + b*e**3*n*x**5*log(x)/5 - b*e**3*n*x**5/25 + b*e**3*x**5*log
(c)/5
```

3.206 $\int \frac{\left(d+ex^2\right)^3\left(a+b\log(cx^n)\right)}{x^4}\,dx$

Optimal. Leaf size=121

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{x}+3de^2x\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}e^3x^3\left(a+b\log\left(cx^n\right)\right)-\frac{bd^3n}{9x^3}-\frac{3bd^2en}{x}-3b$$

```
[Out] -1/9*b*d^3*n/x^3-3*b*d^2*e*n/x-3*b*d*e^2*n*x-1/9*b*e^3*n*x^3-1/3*d^3*(a+b*l
n(c*x^n))/x^3-3*d^2*e*(a+b*ln(c*x^n))/x+3*d*e^2*x*(a+b*ln(c*x^n))+1/3*e^3*x
^3*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.09, antiderivative size = 91, normalized size of antiderivative = 0.75, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {270, 2334, 12}

$$-\frac{1}{3}\left(\frac{9d^2e}{x}+\frac{d^3}{x^3}-9de^2x-e^3x^3\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2en}{x}-\frac{bd^3n}{9x^3}-3bde^2nx-\frac{1}{9}be^3nx^3$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^3*n)/(9*x^3) - (3*b*d^2*e*n)/x - 3*b*d*e^2*n*x - (b*e^3*n*x^3)/9 - ((
d^3/x^3 + (9*d^2*e)/x - 9*d*e^2*x - e^3*x^3)*(a + b*Log[c*x^n]))/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{x^4}\,dx &= -\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{9d^2e}{x}-9de^2x-e^3x^3\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{1}{3}\left(9de^2-\frac{d^3}{x^4}-\frac{9d}{x}\right.\\ &= -\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{9d^2e}{x}-9de^2x-e^3x^3\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}(bn)\int\left(9de^2-\frac{d^3}{x^4}-\frac{9d}{x}\right.\\ &= -\frac{bd^3n}{9x^3}-\frac{3bd^2en}{x}-3bde^2nx-\frac{1}{9}be^3nx^3-\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{9d^2e}{x}-9de^2x-e^3x^3\right)\left(a+\right.\end{aligned}$$

Mathematica [A] time = 0.06, size = 112, normalized size = 0.93

$$-\frac{3a\left(d^3+9d^2ex^2-9de^2x^4-e^3x^6\right)+3b\left(d^3+9d^2ex^2-9de^2x^4-e^3x^6\right)\log\left(cx^n\right)+bn\left(d^3+27d^2ex^2+27de^2x^4+\right.}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -1/9*(3*a*(d^3 + 9*d^2*e*x^2 - 9*d*e^2*x^4 - e^3*x^6) + b*n*(d^3 + 27*d^2*e
*x^2 + 27*d*e^2*x^4 + e^3*x^6) + 3*b*(d^3 + 9*d^2*e*x^2 - 9*d*e^2*x^4 - e^3
*x^6)*Log[c*x^n])/x^3
```

fricas [A] time = 0.47, size = 156, normalized size = 1.29

$$-\frac{\left(be^3n - 3\,ae^3\right)x^6 + bd^3n + 27\left(bde^2n - ade^2\right)x^4 + 3\,ad^3 + 27\left(bd^2en + ad^2e\right)x^2 - 3\left(be^3x^6 + 9\,bde^2x^4 - 9\,bd^2e\right.}{9\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*((b*e^3*n - 3*a*e^3)*x^6 + b*d^3*n + 27*(b*d*e^2*n - a*d*e^2)*x^4 + 3*
a*d^3 + 27*(b*d^2*e*n + a*d^2*e)*x^2 - 3*(b*e^3*x^6 + 9*b*d*e^2*x^4 - 9*b*d
^2*e*x^2 - b*d^3)*log(c) - 3*(b*e^3*n*x^6 + 9*b*d*e^2*n*x^4 - 9*b*d^2*e*n*x
^2 - b*d^3*n)*log(x))/x^3
```

giac [A] time = 0.26, size = 166, normalized size = 1.37

$$\frac{3\,bnx^6e^3\log(x) - bnx^6e^3 + 3\,bx^6e^3\log(c) + 27\,bdnx^4e^2\log(x) + 3\,ax^6e^3 - 27\,bdnx^4e^2 + 27\,bdx^4e^2\log(c) - 27}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] 1/9*(3*b*n*x^6*e^3*log(x) - b*n*x^6*e^3 + 3*b*x^6*e^3*log(c) + 27*b*d*n*x^4
*e^2*log(x) + 3*a*x^6*e^3 - 27*b*d*n*x^4*e^2 + 27*b*d*x^4*e^2*log(c) - 27*b
*d^2*n*x^2*e*log(x) + 27*a*d*x^4*e^2 - 27*b*d^2*n*x^2*e - 27*b*d^2*x^2*e*lo
g(c) - 27*a*d^2*x^2*e - 3*b*d^3*n*log(x) - b*d^3*n - 3*b*d^3*log(c) - 3*a*d
^3)/x^3
```

maple [C] time = 0.25, size = 585, normalized size = 4.83

$$-\frac{\left(-e^3x^6 - 9d\,e^2x^4 + 9d^2e\,x^2 + d^3\right)b\ln\left(x^n\right)}{3x^3} - \frac{-6a\,e^3x^6 - 54bd\,e^2x^4\ln(c) - 54ad\,e^2x^4 + 6a\,d^3 - 6b\,e^3x^6\ln(c) + 2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(b*ln(c*x^n)+a)/x^4,x)
```

```
[Out] -1/3*b*(-e^3*x^6-9*d*e^2*x^4+9*d^2*e*x^2+d^3)/x^3*ln(x^n)-1/18*(-6*a*e^3*x^
6-54*b*d*e^2*x^4*ln(c)-54*a*d*e^2*x^4+6*a*d^3-6*b*e^3*x^6*ln(c)+2*b*d^3*n+6
*b*d^3*ln(c)+54*a*d^2*e*x^2+54*b*d^2*e*x^2*ln(c)-3*I*Pi*b*d^3*csgn(I*c*x^n)
^3+2*b*e^3*n*x^6+27*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+3*I*Pi*b*e^3
*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+27*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-27*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)-27*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-27*I*Pi*b*d*e^2*x^4*csgn(I
*x^n)*csgn(I*c*x^n)^2+27*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+3*I*P
i*b*e^3*x^6*csgn(I*c*x^n)^3+3*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+3*I*Pi
*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-27*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^3-3*I*Pi
*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+27*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n
)^3-3*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b*e^3*x^6*csgn(I*x^n)
*csgn(I*c*x^n)^2+54*b*d*e^2*n*x^4+54*b*d^2*e*n*x^2)/x^3
```

maxima [A] time = 0.50, size = 137, normalized size = 1.13

$$-\frac{1}{9}\,be^3nx^3+\frac{1}{3}\,be^3x^3\log\left(cx^n\right)+\frac{1}{3}\,ae^3x^3-3\,bde^2nx+3\,bde^2x\log\left(cx^n\right)+3\,ade^2x-\frac{3\,bd^2en}{x}-\frac{3\,bd^2e\log\left(cx^n\right)}{x}-\frac{3\,ad^2e}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^3*n*x^3 + 1/3*b*e^3*x^3*log(c*x^n) + 1/3*a*e^3*x^3 - 3*b*d*e^2*n*x
 + 3*b*d*e^2*x*log(c*x^n) + 3*a*d*e^2*x - 3*b*d^2*e*n/x - 3*b*d^2*e*log(c*x
^n)/x - 3*a*d^2*e/x - 1/9*b*d^3*n/x^3 - 1/3*b*d^3*log(c*x^n)/x^3 - 1/3*a*d^
3/x^3
```

mupad [B] time = 3.53, size = 141, normalized size = 1.17

$$\ln(c\,x^n)\left(\frac{\frac{8\,b\,e^3\,x^6}{3}+8\,b\,d\,e^2\,x^4}{x^3}-\frac{\frac{b\,d^3}{3}+3\,b\,d^2\,e\,x^2+5\,b\,d\,e^2\,x^4+\frac{7\,b\,e^3\,x^6}{3}}{x^3}\right)-\frac{a\,d^3+x^2\,\left(9\,a\,d^2\,e+9\,b\,d^2\,e\,n\right)+\frac{b\,d^3\,n}{3}}{3\,x^3}+\frac{e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^3*(a + b*log(c*x^n)))/x^4,x)
```

```
[Out] log(c*x^n)*(((8*b*e^3*x^6)/3 + 8*b*d*e^2*x^4)/x^3 - ((b*d^3)/3 + (7*b*e^3*x
^6)/3 + 3*b*d^2*e*x^2 + 5*b*d*e^2*x^4)/x^3) - (a*d^3 + x^2*(9*a*d^2*e + 9*b
*d^2*e*n) + (b*d^3*n)/3)/(3*x^3) + (e^3*x^3*(3*a - b*n))/9 + 3*d*e^2*x*(a -
 b*n)
```

sympy [A] time = 6.92, size = 202, normalized size = 1.67

$$-\frac{ad^3}{3x^3}-\frac{3ad^2e}{x}+3ade^2x+\frac{ae^3x^3}{3}-\frac{bd^3n\log(x)}{3x^3}-\frac{bd^3n}{9x^3}-\frac{bd^3\log(c)}{3x^3}-\frac{3bd^2en\log(x)}{x}-\frac{3bd^2en}{x}-\frac{3bd^2e\log(c)}{x}+3bde^2nx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d**3/(3*x**3) - 3*a*d**2*e/x + 3*a*d*e**2*x + a*e**3*x**3/3 - b*d**3*n*l
og(x)/(3*x**3) - b*d**3*n/(9*x**3) - b*d**3*log(c)/(3*x**3) - 3*b*d**2*e*n*
log(x)/x - 3*b*d**2*e*n/x - 3*b*d**2*e*log(c)/x + 3*b*d*e**2*n*x*log(x) - 3
*b*d*e**2*n*x + 3*b*d*e**2*x*log(c) + b*e**3*n*x**3*log(x)/3 - b*e**3*n*x**
3/9 + b*e**3*x**3*log(c)/3
```

3.207 $\int \frac{\left(d+ex^2\right)^3\left(a+b\log(cx^n)\right)}{x^6}\,dx$

Optimal. Leaf size=118

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{d^2e\left(a+b\log\left(cx^n\right)\right)}{x^3}-\frac{3de^2\left(a+b\log\left(cx^n\right)\right)}{x}+e^3x\left(a+b\log\left(cx^n\right)\right)-\frac{bd^3n}{25x^5}-\frac{bd^2en}{3x^3}-\frac{3bde^2}{x}$$

```
[Out] -1/25*b*d^3*n/x^5-1/3*b*d^2*e*n/x^3-3*b*d*e^2*n/x-b*e^3*n*x-1/5*d^3*(a+b*ln
(c*x^n))/x^5-d^2*e*(a+b*ln(c*x^n))/x^3-3*d*e^2*(a+b*ln(c*x^n))/x+e^3*x*(a+b
*ln(c*x^n))
```

Rubi [A] time = 0.09, antiderivative size = 91, normalized size of antiderivative = 0.77, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$-\frac{1}{5}\left(\frac{5d^2e}{x^3}+\frac{d^3}{x^5}+\frac{15de^2}{x}-5e^3x\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2en}{3x^3}-\frac{bd^3n}{25x^5}-\frac{3bde^2n}{x}-be^3nx$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d^3*n)/(25*x^5) - (b*d^2*e*n)/(3*x^3) - (3*b*d*e^2*n)/x - b*e^3*n*x - (
(d^3/x^5 + (5*d^2*e)/x^3 + (15*d*e^2)/x - 5*e^3*x)*(a + b*Log[c*x^n]))/5
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{x^6}\,dx &= -\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{5d^2e}{x^3}+\frac{15de^2}{x}-5e^3x\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(e^3-\frac{d^3}{5x^6}-\right.\\ &= -\frac{bd^3n}{25x^5}-\frac{bd^2en}{3x^3}-\frac{3bde^2n}{x}-be^3nx-\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{5d^2e}{x^3}+\frac{15de^2}{x}-5e^3x\right)\left(a+\right.\end{aligned}$$

Mathematica [A] time = 0.06, size = 115, normalized size = 0.97

$$-\frac{15a\left(d^3+5d^2ex^2+15de^2x^4-5e^3x^6\right)+15b\left(d^3+5d^2ex^2+15de^2x^4-5e^3x^6\right)\log\left(cx^n\right)+bn\left(3d^3+25d^2ex^2+\right.}{75x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -1/75*(15*a*(d^3 + 5*d^2*e*x^2 + 15*d*e^2*x^4 - 5*e^3*x^6) + b*n*(3*d^3 + 2
5*d^2*e*x^2 + 225*d*e^2*x^4 + 75*e^3*x^6) + 15*b*(d^3 + 5*d^2*e*x^2 + 15*d*
e^2*x^4 - 5*e^3*x^6)*Log[c*x^n])/x^5
```

fricas [A] time = 0.66, size = 160, normalized size = 1.36

$$-\frac{75\left(be^3n-ae^3\right)x^6+3\,bd^3n+225\left(bde^2n+ade^2\right)x^4+15\,ad^3+25\left(bd^2en+3\,ad^2e\right)x^2-15\left(5\,be^3x^6-15\,bde^2x^4\cdots\right.}{75\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/75*(75*(b*e^3*n - a*e^3)*x^6 + 3*b*d^3*n + 225*(b*d*e^2*n + a*d*e^2)*x^4
 + 15*a*d^3 + 25*(b*d^2*e*n + 3*a*d^2*e)*x^2 - 15*(5*b*e^3*x^6 - 15*b*d*e^2
*x^4 - 5*b*d^2*e*x^2 - b*d^3)*log(c) - 15*(5*b*e^3*n*x^6 - 15*b*d*e^2*n*x^4
 - 5*b*d^2*e*n*x^2 - b*d^3*n)*log(x))/x^5
```

giac [A] time = 0.39, size = 166, normalized size = 1.41

$$\frac{75\,bnx^6e^3\log(x)-75\,bnx^6e^3+75\,bx^6e^3\log(c)-225\,bdnx^4e^2\log(x)+75\,ax^6e^3-225\,bdnx^4e^2-225\,bdx^4e^2\log(\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] 1/75*(75*b*n*x^6*e^3*log(x) - 75*b*n*x^6*e^3 + 75*b*x^6*e^3*log(c) - 225*b*
d*n*x^4*e^2*log(x) + 75*a*x^6*e^3 - 225*b*d*n*x^4*e^2 - 225*b*d*x^4*e^2*log
(c) - 75*b*d^2*n*x^2*e*log(x) - 225*a*d*x^4*e^2 - 25*b*d^2*n*x^2*e - 75*b*d
^2*x^2*e*log(c) - 75*a*d^2*x^2*e - 15*b*d^3*n*log(x) - 3*b*d^3*n - 15*b*d^3
*log(c) - 15*a*d^3)/x^5
```

maple [C] time = 0.26, size = 585, normalized size = 4.96

$$-\frac{\left(-5e^3x^6+15d\,e^2x^4+5d^2e\,x^2+d^3\right)b\ln\left(x^n\right)}{5x^5}-\frac{-150a\,e^3x^6+450bd\,e^2x^4\ln(c)+450ad\,e^2x^4+30a\,d^3-150b\,e^3x^6\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(b*ln(c*x^n)+a)/x^6,x)
```

```
[Out] -1/5*b*(-5*e^3*x^6+15*d*e^2*x^4+5*d^2*e*x^2+d^3)/x^5*ln(x^n)-1/150*(75*I*Pi
*b*d^2*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)-150*a*e^3*x^6+450*b*d*e^2*x^4*ln(c)+
450*a*d*e^2*x^4+30*a*d^3-150*b*e^3*x^6*ln(c)+6*b*d^3*n+30*b*d^3*ln(c)+150*a
*d^2*e*x^2-75*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+150*b*d^
2*e*x^2*ln(c)+150*b*e^3*n*x^6+75*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)+225*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-225*I*Pi*b*d*e^2*x^
4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-75*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*
c*x^n)^2-15*I*Pi*b*d^3*csgn(I*c*x^n)^3+225*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csg
n(I*c*x^n)^2+75*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-75*I*Pi*b*d^2*
e*x^2*csgn(I*c*x^n)^3-15*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+15*
I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+15*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n
)^2+75*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^3-75*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*csg
n(I*c)-225*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^3+450*b*d*e^2*n*x^4+50*b*d^2*e*n*
x^2)/x^5
```

maxima [A] time = 0.65, size = 135, normalized size = 1.14

$$-be^3nx+be^3x\log\left(cx^n\right)+ae^3x-\frac{3\,bde^2n}{x}-\frac{3\,bde^2\log\left(cx^n\right)}{x}-\frac{3\,ade^2}{x}-\frac{bd^2en}{3\,x^3}-\frac{bd^2e\log\left(cx^n\right)}{x^3}-\frac{ad^2e}{x^3}-\frac{bd^3n}{25\,x^5}-\frac{bd^3\log\left(c\cdots\right.}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] -b*e^3*n*x + b*e^3*x*log(c*x^n) + a*e^3*x - 3*b*d*e^2*n/x - 3*b*d*e^2*log(c
*x^n)/x - 3*a*d*e^2/x - 1/3*b*d^2*e*n/x^3 - b*d^2*e*log(c*x^n)/x^3 - a*d^2*
e/x^3 - 1/25*b*d^3*n/x^5 - 1/5*b*d^3*log(c*x^n)/x^5 - 1/5*a*d^3/x^5
```

mupad [B] time = 3.58, size = 125, normalized size = 1.06

$$e^3\,x\,\left(a-b\,n\right)-\frac{a\,d^3+x^2\,\left(5\,a\,d^2\,e+\frac{5\,b\,d^2\,e\,n}{3}\right)+x^4\,\left(15\,a\,d\,e^2+15\,b\,d\,e^2\,n\right)+\frac{b\,d^3\,n}{5}}{5\,x^5}-\ln\left(c\,x^n\right)\,\left(\frac{\frac{b\,d^3}{5}+b\,d^2\,e\,x^2+3\,b}{x^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^3*(a + b*log(c*x^n)))/x^6,x)
```

```
[Out] e^3*x*(a - b*n) - (a*d^3 + x^2*(5*a*d^2*e + (5*b*d^2*e*n)/3) + x^4*(15*a*d*
e^2 + 15*b*d*e^2*n) + (b*d^3*n)/5)/(5*x^5) - log(c*x^n)*(((b*d^3)/5 + (11*b
*e^3*x^6)/5 + b*d^2*e*x^2 + 3*b*d*e^2*x^4)/x^5 - (16*b*e^3*x)/5)
```

sympy [A] time = 6.97, size = 190, normalized size = 1.61

$$-\frac{ad^3}{5x^5}-\frac{ad^2e}{x^3}-\frac{3ade^2}{x}+ae^3x-\frac{bd^3n\log\left(x\right)}{5x^5}-\frac{bd^3n}{25x^5}-\frac{bd^3\log\left(c\right)}{5x^5}-\frac{bd^2en\log\left(x\right)}{x^3}-\frac{bd^2en}{3x^3}-\frac{bd^2e\log\left(c\right)}{x^3}-\frac{3bde^2n\log\left(x\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] -a*d**3/(5*x**5) - a*d**2*e/x**3 - 3*a*d*e**2/x + a*e**3*x - b*d**3*n*log(x
)/(5*x**5) - b*d**3*n/(25*x**5) - b*d**3*log(c)/(5*x**5) - b*d**2*e*n*log(x
)/x**3 - b*d**2*e*n/(3*x**3) - b*d**2*e*log(c)/x**3 - 3*b*d*e**2*n*log(x)/x
 - 3*b*d*e**2*n/x - 3*b*d*e**2*log(c)/x + b*e**3*n*x*log(x) - b*e**3*n*x +
b*e**3*x*log(c)
```

3.208 $\int \frac{(d+ex^2)^3 (a+b\log(cx^n))}{x^8} dx$

Optimal. Leaf size=127

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{7x^7}-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{de^2\left(a+b\log\left(cx^n\right)\right)}{x^3}-\frac{e^3\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{bd^3n}{49x^7}-\frac{3bd^2en}{25x^5}-\frac{bde^2n}{3x^3}-$$

```
[Out] -1/49*b*d^3*n/x^7-3/25*b*d^2*e*n/x^5-1/3*b*d*e^2*n/x^3-b*e^3*n/x-1/7*d^3*(a
+b*ln(c*x^n))/x^7-3/5*d^2*e*(a+b*ln(c*x^n))/x^5-d*e^2*(a+b*ln(c*x^n))/x^3-e
^3*(a+b*ln(c*x^n))/x
```

Rubi [A] time = 0.10, antiderivative size = 98, normalized size of antiderivative = 0.77, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{35}\left(\frac{21d^2e}{x^5}+\frac{5d^3}{x^7}+\frac{35de^2}{x^3}+\frac{35e^3}{x}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2en}{25x^5}-\frac{bd^3n}{49x^7}-\frac{bde^2n}{3x^3}-\frac{be^3n}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^3*n)/(49*x^7) - (3*b*d^2*e*n)/(25*x^5) - (b*d*e^2*n)/(3*x^3) - (b*e^3
*n)/x - (((5*d^3)/x^7 + (21*d^2*e)/x^5 + (35*d*e^2)/x^3 + (35*e^3)/x)*(a +
b*Log[c*x^n]))/35
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^2)^3 (a+b\log(cx^n))}{x^8}\,dx = -\frac{1}{35}\left(\frac{5d^3}{x^7}+\frac{21d^2e}{x^5}+\frac{35de^2}{x^3}+\frac{35e^3}{x}\right)(a+b\log(cx^n)) - (bn)\int \frac{-5d^3-2\cdots}{\cdots}$$
$$= -\frac{1}{35}\left(\frac{5d^3}{x^7}+\frac{21d^2e}{x^5}+\frac{35de^2}{x^3}+\frac{35e^3}{x}\right)(a+b\log(cx^n)) - \frac{1}{35}(bn)\int \frac{-5d^3-\cdots}{\cdots}$$
$$= -\frac{1}{35}\left(\frac{5d^3}{x^7}+\frac{21d^2e}{x^5}+\frac{35de^2}{x^3}+\frac{35e^3}{x}\right)(a+b\log(cx^n)) - \frac{1}{35}(bn)\int\left(-\frac{5d^3}{x^8}\cdots\right.$$
$$= -\frac{bd^3n}{49x^7}-\frac{3bd^2en}{25x^5}-\frac{bde^2n}{3x^3}-\frac{be^3n}{x}-\frac{1}{35}\left(\frac{5d^3}{x^7}+\frac{21d^2e}{x^5}+\frac{35de^2}{x^3}+\frac{35e^3}{x}\right)(\cdots$$

Mathematica [A] time = 0.06, size = 127, normalized size = 1.00

$$-\frac{d^3(a+b\log(cx^n))}{7x^7}-\frac{3d^2e(a+b\log(cx^n))}{5x^5}-\frac{de^2(a+b\log(cx^n))}{x^3}-\frac{e^3(a+b\log(cx^n))}{x}-\frac{bd^3n}{49x^7}-\frac{3bd^2en}{25x^5}-\frac{bde^2\cdots}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -1/49*(b*d^3*n)/x^7 - (3*b*d^2*e*n)/(25*x^5) - (b*d*e^2*n)/(3*x^3) - (b*e^3
*n)/x - (d^3*(a + b*Log[c*x^n]))/(7*x^7) - (3*d^2*e*(a + b*Log[c*x^n]))/(5*
x^5) - (d*e^2*(a + b*Log[c*x^n]))/x^3 - (e^3*(a + b*Log[c*x^n]))/x
```

fricas [A] time = 0.62, size = 160, normalized size = 1.26

$$-\frac{3675\,(be^3n+ae^3)x^6+75\,bd^3n+1225\,(bde^2n+3\,ade^2)x^4+525\,ad^3+441\,(bd^2en+5\,ad^2e)x^2+105\,(35\,be^3\cdots}{3675\,\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")
```

```
[Out] -1/3675*(3675*(b*e^3*n + a*e^3)*x^6 + 75*b*d^3*n + 1225*(b*d*e^2*n + 3*a*d*
e^2)*x^4 + 525*a*d^3 + 441*(b*d^2*e*n + 5*a*d^2*e)*x^2 + 105*(35*b*e^3*x^6
+ 35*b*d*e^2*x^4 + 21*b*d^2*e*x^2 + 5*b*d^3)*log(c) + 105*(35*b*e^3*n*x^6 +
 35*b*d*e^2*n*x^4 + 21*b*d^2*e*n*x^2 + 5*b*d^3*n)*log(x))/x^7
```

giac [A] time = 0.27, size = 166, normalized size = 1.31

$$-\frac{3675\,bnx^6e^3\log(x)+3675\,bnx^6e^3+3675\,bx^6e^3\log(c)+3675\,bdnx^4e^2\log(x)+3675\,ax^6e^3+1225\,bdnx^4e^2\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="giac")
```

```
[Out] -1/3675*(3675*b*n*x^6*e^3*log(x) + 3675*b*n*x^6*e^3 + 3675*b*x^6*e^3*log(c)
 + 3675*b*d*n*x^4*e^2*log(x) + 3675*a*x^6*e^3 + 1225*b*d*n*x^4*e^2 + 3675*b
*d*x^4*e^2*log(c) + 2205*b*d^2*n*x^2*e*log(x) + 3675*a*d*x^4*e^2 + 441*b*d^
2*n*x^2*e + 2205*b*d^2*x^2*e*log(c) + 2205*a*d^2*x^2*e + 525*b*d^3*n*log(x)
 + 75*b*d^3*n + 525*b*d^3*log(c) + 525*a*d^3)/x^7
```

maple [C] time = 0.18, size = 587, normalized size = 4.62

$$-\frac{(35e^3x^6+35d\,e^2x^4+21d^2e\,x^2+5d^3)\,b\ln(x^n)}{35x^7}-\frac{7350a\,e^3x^6+7350bd\,e^2x^4\ln(c)+7350ad\,e^2x^4+1050a\,d^3+\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(b*ln(c*x^n)+a)/x^8,x)
```

```
[Out] -1/35*b*(35*e^3*x^6+35*d*e^2*x^4+21*d^2*e*x^2+5*d^3)/x^7*ln(x^n)-1/7350*(73
50*a*e^3*x^6+7350*b*d*e^2*x^4*ln(c)+7350*a*d*e^2*x^4+1050*a*d^3-3675*I*Pi*b
*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2205*I*Pi*b*d^2*e*x^2*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)+7350*b*e^3*x^6*ln(c)+150*b*d^3*n+1050*b*d^3*l
n(c)+4410*a*d^2*e*x^2+4410*b*d^2*e*x^2*ln(c)+7350*b*e^3*n*x^6-525*I*Pi*b*d^
3*csgn(I*c*x^n)^3+2205*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+2205*I*
Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)-3675*I*Pi*b*e^3*x^6*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)+3675*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+3675*
I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-3675*I*Pi*b*e^3*x^6*csgn(I*c*x
^n)^3+525*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+525*I*Pi*b*d^3*csgn(I*c*x^
n)^2*csgn(I*c)-2205*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^3-525*I*Pi*b*d^3*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+3675*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)^
2+2450*b*d*e^2*n*x^4+882*b*d^2*e*n*x^2+3675*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*
csgn(I*c)-3675*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^3)/x^7
```

maxima [A] time = 0.68, size = 143, normalized size = 1.13

$$-\frac{be^3n}{x}-\frac{be^3\log(cx^n)}{x}-\frac{ae^3}{x}-\frac{bde^2n}{3x^3}-\frac{bde^2\log(cx^n)}{x^3}-\frac{ade^2}{x^3}-\frac{3bd^2en}{25x^5}-\frac{3bd^2e\log(cx^n)}{5x^5}-\frac{3ad^2e}{5x^5}-\frac{bd^3n}{49x^7}-\frac{bd^3\log(cx^n)}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")
```

```
[Out] -b*e^3*n/x - b*e^3*log(c*x^n)/x - a*e^3/x - 1/3*b*d*e^2*n/x^3 - b*d*e^2*log
(c*x^n)/x^3 - a*d*e^2/x^3 - 3/25*b*d^2*e*n/x^5 - 3/5*b*d^2*e*log(c*x^n)/x^5
 - 3/5*a*d^2*e/x^5 - 1/49*b*d^3*n/x^7 - 1/7*b*d^3*log(c*x^n)/x^7 - 1/7*a*d^
3/x^7
```

mupad [B] time = 3.80, size = 123, normalized size = 0.97

$$-\frac{x^6\left(35\,a\,e^3+35\,b\,e^3\,n\right)+5\,a\,d^3+x^2\left(21\,a\,d^2\,e+\frac{21\,b\,d^2\,e\,n}{5}\right)+x^4\left(35\,a\,d\,e^2+\frac{35\,b\,d\,e^2\,n}{3}\right)+\frac{5\,b\,d^3\,n}{7}}{35\,x^7}-\frac{\ln\left(c\,x^n\right)\left(\frac{b\,d^3}{7}+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^3*(a + b*log(c*x^n)))/x^8,x)
```

```
[Out] - (x^6*(35*a*e^3 + 35*b*e^3*n) + 5*a*d^3 + x^2*(21*a*d^2*e + (21*b*d^2*e*n)
/5) + x^4*(35*a*d*e^2 + (35*b*d*e^2*n)/3) + (5*b*d^3*n)/7)/(35*x^7) - (log(
c*x^n)*((b*d^3)/7 + b*e^3*x^6 + (3*b*d^2*e*x^2)/5 + b*d*e^2*x^4))/x^7
```

sympy [A] time = 10.39, size = 206, normalized size = 1.62

$$-\frac{ad^3}{7x^7}-\frac{3ad^2e}{5x^5}-\frac{ade^2}{x^3}-\frac{ae^3}{x}-\frac{bd^3n\log(x)}{7x^7}-\frac{bd^3n}{49x^7}-\frac{bd^3\log(c)}{7x^7}-\frac{3bd^2en\log(x)}{5x^5}-\frac{3bd^2en}{25x^5}-\frac{3bd^2e\log(c)}{5x^5}-\frac{bde^2n\log(x)}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] -a*d**3/(7*x**7) - 3*a*d**2*e/(5*x**5) - a*d*e**2/x**3 - a*e**3/x - b*d**3*
n*log(x)/(7*x**7) - b*d**3*n/(49*x**7) - b*d**3*log(c)/(7*x**7) - 3*b*d**2*
e*n*log(x)/(5*x**5) - 3*b*d**2*e*n/(25*x**5) - 3*b*d**2*e*log(c)/(5*x**5) -
 b*d*e**2*n*log(x)/x**3 - b*d*e**2*n/(3*x**3) - b*d*e**2*log(c)/x**3 - b*e*
*3*n*log(x)/x - b*e**3*n/x - b*e**3*log(c)/x
```

3.209 $\int \frac{(d+ex^2)^3 (a+b\log(cx^n))}{x^{10}}\,dx$

Optimal. Leaf size=133

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{9x^9}-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{7x^7}-\frac{3de^2\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{e^3\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{bd^3n}{81x^9}-\frac{3bd^2en}{49x^7}-\frac{3bd}{25}$$

```
[Out] -1/81*b*d^3*n/x^9-3/49*b*d^2*e*n/x^7-3/25*b*d*e^2*n/x^5-1/9*b*e^3*n/x^3-1/9
*d^3*(a+b*ln(c*x^n))/x^9-3/7*d^2*e*(a+b*ln(c*x^n))/x^7-3/5*d*e^2*(a+b*ln(c*
x^n))/x^5-1/3*e^3*(a+b*ln(c*x^n))/x^3
```

Rubi [A] time = 0.10, antiderivative size = 100, normalized size of antiderivative = 0.75, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{315}\left(\frac{135d^2e}{x^7}+\frac{35d^3}{x^9}+\frac{189de^2}{x^5}+\frac{105e^3}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2en}{49x^7}-\frac{bd^3n}{81x^9}-\frac{3bde^2n}{25x^5}-\frac{be^3n}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] -(b*d^3*n)/(81*x^9) - (3*b*d^2*e*n)/(49*x^7) - (3*b*d*e^2*n)/(25*x^5) - (b*
e^3*n)/(9*x^3) - (((35*d^3)/x^9 + (135*d^2*e)/x^7 + (189*d*e^2)/x^5 + (105*
e^3)/x^3)*(a + b*Log[c*x^n]))/315
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^2)^3 (a+b\log(cx^n))}{x^{10}}\,dx = -\frac{1}{315}\left(\frac{35d^3}{x^9}+\frac{135d^2e}{x^7}+\frac{189de^2}{x^5}+\frac{105e^3}{x^3}\right)(a+b\log(cx^n)) - (bn)\int \frac{-35d^3}{}$$

$$= -\frac{1}{315}\left(\frac{35d^3}{x^9}+\frac{135d^2e}{x^7}+\frac{189de^2}{x^5}+\frac{105e^3}{x^3}\right)(a+b\log(cx^n)) - \frac{1}{315}(bn)\int \frac{-3}{}$$

$$= -\frac{1}{315}\left(\frac{35d^3}{x^9}+\frac{135d^2e}{x^7}+\frac{189de^2}{x^5}+\frac{105e^3}{x^3}\right)(a+b\log(cx^n)) - \frac{1}{315}(bn)\int \Big(-$$

$$= -\frac{bd^3n}{81x^9}-\frac{3bd^2en}{49x^7}-\frac{3bde^2n}{25x^5}-\frac{be^3n}{9x^3}-\frac{1}{315}\left(\frac{35d^3}{x^9}+\frac{135d^2e}{x^7}+\frac{189de^2}{x^5}+\frac{105e}{x^3}\right.$$

Mathematica [A] time = 0.06, size = 133, normalized size = 1.00

$$-\frac{d^3(a+b\log(cx^n))}{9x^9}-\frac{3d^2e(a+b\log(cx^n))}{7x^7}-\frac{3de^2(a+b\log(cx^n))}{5x^5}-\frac{e^3(a+b\log(cx^n))}{3x^3}-\frac{bd^3n}{81x^9}-\frac{3bd^2en}{49x^7}-\frac{3bde^2n}{25x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] -1/81*(b*d^3*n)/x^9 - (3*b*d^2*e*n)/(49*x^7) - (3*b*d*e^2*n)/(25*x^5) - (b*
e^3*n)/(9*x^3) - (d^3*(a + b*Log[c*x^n]))/(9*x^9) - (3*d^2*e*(a + b*Log[c*x
^n]))/(7*x^7) - (3*d*e^2*(a + b*Log[c*x^n]))/(5*x^5) - (e^3*(a + b*Log[c*x^
n]))/(3*x^3)
```

fricas [A] time = 0.49, size = 161, normalized size = 1.21

$$-\frac{11025\,(be^3n+3\,ae^3)x^6+1225\,bd^3n+11907\,(bde^2n+5\,ade^2)x^4+11025\,ad^3+6075\,(bd^2en+7\,ad^2e)x^2+315\,(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^10,x, algorithm="fricas")
```

```
[Out] -1/99225*(11025*(b*e^3*n + 3*a*e^3)*x^6 + 1225*b*d^3*n + 11907*(b*d*e^2*n +
 5*a*d*e^2)*x^4 + 11025*a*d^3 + 6075*(b*d^2*e*n + 7*a*d^2*e)*x^2 + 315*(105
*b*e^3*x^6 + 189*b*d*e^2*x^4 + 135*b*d^2*e*x^2 + 35*b*d^3)*log(c) + 315*(10
5*b*e^3*n*x^6 + 189*b*d*e^2*n*x^4 + 135*b*d^2*e*n*x^2 + 35*b*d^3*n)*log(x))
/x^9
```

giac [A] time = 0.29, size = 166, normalized size = 1.25

$$-\frac{33075\,bnx^6e^3\log(x)+11025\,bnx^6e^3+33075\,bx^6e^3\log(c)+59535\,bdnx^4e^2\log(x)+33075\,ax^6e^3+11907\,bdnx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^10,x, algorithm="giac")
```

```
[Out] -1/99225*(33075*b*n*x^6*e^3*log(x) + 11025*b*n*x^6*e^3 + 33075*b*x^6*e^3*lo
g(c) + 59535*b*d*n*x^4*e^2*log(x) + 33075*a*x^6*e^3 + 11907*b*d*n*x^4*e^2 +
 59535*b*d*x^4*e^2*log(c) + 42525*b*d^2*n*x^2*e*log(x) + 59535*a*d*x^4*e^2
+ 6075*b*d^2*n*x^2*e + 42525*b*d^2*x^2*e*log(c) + 42525*a*d^2*x^2*e + 11025
*b*d^3*n*log(x) + 1225*b*d^3*n + 11025*b*d^3*log(c) + 11025*a*d^3)/x^9
```

maple [C] time = 0.18, size = 587, normalized size = 4.41

$$-\frac{(105e^3x^6+189d\,e^2x^4+135d^2e\,x^2+35d^3)\,b\ln(x^n)}{315x^9}-\frac{66150a\,e^3x^6+119070bd\,e^2x^4\ln(c)+119070ad\,e^2x^4+2205}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(b*ln(c*x^n)+a)/x^10,x)
```

```
[Out] -1/315*b*(105*e^3*x^6+189*d*e^2*x^4+135*d^2*e*x^2+35*d^3)/x^9*ln(x^n)-1/198
450*(66150*a*e^3*x^6+119070*b*d*e^2*x^4*ln(c)+119070*a*d*e^2*x^4+22050*a*d^
3+66150*b*e^3*x^6*ln(c)+2450*b*d^3*n+22050*b*d^3*ln(c)+85050*a*d^2*e*x^2-59
535*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-42525*I*Pi*b*d^2*e
*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+59535*I*Pi*b*d*e^2*x^4*csgn(I*x^n)
*csgn(I*c*x^n)^2+42525*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+85050*b
*d^2*e*x^2*ln(c)+22050*b*e^3*n*x^6-11025*I*Pi*b*d^3*csgn(I*c*x^n)^3+42525*I
*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)-33075*I*Pi*b*e^3*x^6*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)+59535*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+11
025*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+11025*I*Pi*b*d^3*csgn(I*c*x^n)^2
*csgn(I*c)-33075*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^3+33075*I*Pi*b*e^3*x^6*csgn(I
*c*x^n)^2*csgn(I*c)-59535*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^3+23814*b*d*e^2*n*
x^4+12150*b*d^2*e*n*x^2-42525*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^3-11025*I*Pi*b
*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+33075*I*Pi*b*e^3*x^6*csgn(I*x^n)*c
sgn(I*c*x^n)^2)/x^9
```

maxima [A] time = 0.63, size = 143, normalized size = 1.08

$$-\frac{be^3n}{9\,x^3}-\frac{be^3\log\left(cx^n\right)}{3\,x^3}-\frac{ae^3}{3\,x^3}-\frac{3\,bde^2n}{25\,x^5}-\frac{3\,bde^2\log\left(cx^n\right)}{5\,x^5}-\frac{3\,ade^2}{5\,x^5}-\frac{3\,bd^2en}{49\,x^7}-\frac{3\,bd^2e\log\left(cx^n\right)}{7\,x^7}-\frac{3\,ad^2e}{7\,x^7}-\frac{bd^3n}{81\,x^9}-\frac{bd^3 \mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^10,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^3*n/x^3 - 1/3*b*e^3*log(c*x^n)/x^3 - 1/3*a*e^3/x^3 - 3/25*b*d*e^2*
n/x^5 - 3/5*b*d*e^2*log(c*x^n)/x^5 - 3/5*a*d*e^2/x^5 - 3/49*b*d^2*e*n/x^7 -
 3/7*b*d^2*e*log(c*x^n)/x^7 - 3/7*a*d^2*e/x^7 - 1/81*b*d^3*n/x^9 - 1/9*b*d^
3*log(c*x^n)/x^9 - 1/9*a*d^3/x^9
```

mupad [B] time = 3.70, size = 125, normalized size = 0.94

$$-\frac{x^6\,\left(105\,a\,e^3+35\,b\,e^3\,n\right)+35\,a\,d^3+x^2\,\left(135\,a\,d^2\,e+\frac{135\,b\,d^2\,e\,n}{7}\right)+x^4\,\left(189\,a\,d\,e^2+\frac{189\,b\,d\,e^2\,n}{5}\right)+\frac{35\,b\,d^3\,n}{9}}{315\,x^9}-\frac{\ln\left(c\,x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^3*(a + b*log(c*x^n)))/x^10,x)
```

```
[Out] - (x^6*(105*a*e^3 + 35*b*e^3*n) + 35*a*d^3 + x^2*(135*a*d^2*e + (135*b*d^2*
e*n)/7) + x^4*(189*a*d*e^2 + (189*b*d*e^2*n)/5) + (35*b*d^3*n)/9)/(315*x^9)
 - (log(c*x^n)*((b*d^3)/9 + (b*e^3*x^6)/3 + (3*b*d^2*e*x^2)/7 + (3*b*d*e^2*
x^4)/5))/x^9
```

sympy [A] time = 23.04, size = 231, normalized size = 1.74

$$-\frac{ad^3}{9x^9}-\frac{3ad^2e}{7x^7}-\frac{3ade^2}{5x^5}-\frac{ae^3}{3x^3}-\frac{bd^3n\log\left(x\right)}{9x^9}-\frac{bd^3n}{81x^9}-\frac{bd^3\log\left(c\right)}{9x^9}-\frac{3bd^2en\log\left(x\right)}{7x^7}-\frac{3bd^2en}{49x^7}-\frac{3bd^2e\log\left(c\right)}{7x^7}-\frac{3bde^2n\,\mathrm{l}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**10,x)
```

```
[Out] -a*d**3/(9*x**9) - 3*a*d**2*e/(7*x**7) - 3*a*d*e**2/(5*x**5) - a*e**3/(3*x*
*3) - b*d**3*n*log(x)/(9*x**9) - b*d**3*n/(81*x**9) - b*d**3*log(c)/(9*x**9
) - 3*b*d**2*e*n*log(x)/(7*x**7) - 3*b*d**2*e*n/(49*x**7) - 3*b*d**2*e*log(
c)/(7*x**7) - 3*b*d*e**2*n*log(x)/(5*x**5) - 3*b*d*e**2*n/(25*x**5) - 3*b*d
*e**2*log(c)/(5*x**5) - b*e**3*n*log(x)/(3*x**3) - b*e**3*n/(9*x**3) - b*e*
*3*log(c)/(3*x**3)
```

3.210 $\int \frac{x^5(a+b\log(cx^n))}{d+ex^2}\,dx$

Optimal. Leaf size=121

$$\frac{d^2\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3}-\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{x^4\left(a+b\log\left(cx^n\right)\right)}{4e}+\frac{bd^2n\text{Li}_2\left(-\frac{ex^2}{d}\right)}{4e^3}+\frac{bdnx^2}{4e^2}-\frac{bnx^4}{16e}$$

```
[Out] 1/4*b*d*n*x^2/e^2-1/16*b*n*x^4/e-1/2*d*x^2*(a+b*ln(c*x^n))/e^2+1/4*x^4*(a+b
*ln(c*x^n))/e+1/2*d^2*(a+b*ln(c*x^n))*ln(1+e*x^2/d)/e^3+1/4*b*d^2*n*polylog
(2,-e*x^2/d)/e^3
```

Rubi [A] time = 0.17, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2351, 2304, 2337, 2391}

$$\frac{bd^2n\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^3}+\frac{d^2\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3}-\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{x^4\left(a+b\log\left(cx^n\right)\right)}{4e}+\frac{bdnx^2}{4e^2}-b$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] (b*d*n*x^2)/(4*e^2) - (b*n*x^4)/(16*e) - (d*x^2*(a + b*Log[c*x^n]))/(2*e^2)
 + (x^4*(a + b*Log[c*x^n]))/(4*e) + (d^2*(a + b*Log[c*x^n])*Log[1 + (e*x^2)
/d])/(2*e^3) + (b*d^2*n*PolyLog[2, -((e*x^2)/d)])/(4*e^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
```

```
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^5 \left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx = \int \left(-\frac{dx\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{e}+\frac{d^2x\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)}\right)dx$$

$$= -\frac{d\int x\left(a+b\log\left(cx^n\right)\right)\,dx}{e^2}+\frac{d^2\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx}{e^2}+\frac{\int x^3\left(a+b\log\left(cx^n\right)\right)\,dx}{e}$$

$$= \frac{bdnx^2}{4e^2}-\frac{bnx^4}{16e}-\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{x^4\left(a+b\log\left(cx^n\right)\right)}{4e}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2e^3}$$

$$= \frac{bdnx^2}{4e^2}-\frac{bnx^4}{16e}-\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{x^4\left(a+b\log\left(cx^n\right)\right)}{4e}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2e^3}$$

Mathematica [A] time = 0.12, size = 174, normalized size = 1.44

$$\frac{8d^2\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)\left(a+b\log\left(cx^n\right)\right)+8d^2\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\left(a+b\log\left(cx^n\right)\right)-8dex^2\left(a+b\log\left(cx^n\right)\right)+4e^2x^4\left(a\right.}{16e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] (4*b*d*e*n*x^2 - b*e^2*n*x^4 - 8*d*e*x^2*(a + b*Log[c*x^n]) + 4*e^2*x^4*(a
+ b*Log[c*x^n]) + 8*d^2*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] +
8*d^2*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + 8*b*d^2*n*Poly
Log[2, (Sqrt[e]*x)/Sqrt[-d]] + 8*b*d^2*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2
)])/(16*e^3)
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bx^5\log\left(cx^n\right)+ax^5}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^5*log(c*x^n) + a*x^5)/(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^5}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x^2 + d), x)
```

maple [C] time = 0.22, size = 641, normalized size = 5.30

$$-\frac{bd\,x^2\ln(c)}{2e^2}+\frac{b\,d^2n\operatorname{dilog}\left(\frac{-ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2e^3}+\frac{b\,d^2n\operatorname{dilog}\left(\frac{ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2e^3}+\frac{b\,d^2\ln(x^n)\ln\left(e\,x^2+d\right)}{2e^3}+\frac{b\,d^2\ln(c)\ln\left(e\,x^2+d\right)}{2e^3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(b*ln(c*x^n)+a)/(e*x^2+d),x)
```

```
[Out] -1/2*b*d/e^2*x^2*ln(c)-1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e*x^4
+1/2*b*ln(x^n)*d^2/e^3*ln(e*x^2+d)+1/2*b*ln(c)*d^2/e^3*ln(e*x^2+d)+1/2*b*n*
d^2/e^3*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*d^2/e^3*dilog((e*x+
(-d*e)^(1/2))/(-d*e)^(1/2))+1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x^4-1/4*
I*b*Pi*csgn(I*c*x^n)^3*d^2/e^3*ln(e*x^2+d)+1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2/e*x^4-1/2*b*d/e^2*x^2*ln(x^n)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2
/e^2*x^2*d-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*x^2*d+1/4*I*b*Pi*csgn(I
*c*x^n)^2*csgn(I*c)*d^2/e^3*ln(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n
)^2*d^2/e^3*ln(e*x^2+d)+1/2*a*d^2/e^3*ln(e*x^2+d)+1/4*b*ln(c)/e*x^4+1/4*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*x^2*d-1/4*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*d^2/e^3*ln(e*x^2+d)-1/2*a*d/e^2*x^2-1/8*I*b*Pi*csgn(I
*c*x^n)^3/e*x^4+1/2*b*n*d^2/e^3*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+
1/2*b*n*d^2/e^3*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*d^2/e^3*l
n(x)*ln(e*x^2+d)+1/4*a/e*x^4+1/4*I*b*Pi*csgn(I*c*x^n)^3/e^2*x^2*d+1/4*b*ln(
x^n)/e*x^4-1/16*b*n*x^4/e+1/4*b*d/e^2*n*x^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{4}\,a\left(\frac{2\,d^2\log\left(ex^2+d\right)}{e^3}+\frac{ex^4-2\,dx^2}{e^2}\right)+b\int\frac{x^5\log(c)+x^5\log\left(x^n\right)}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/4*a*(2*d^2*log(e*x^2 + d)/e^3 + (e*x^4 - 2*d*x^2)/e^2) + b*integrate((x^5
*log(c) + x^5*log(x^n))/(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^5\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2),x)
```

```
[Out] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2), x)
```

sympy [A] time = 90.78, size = 235, normalized size = 1.94

$$\frac{ad^2\left(\begin{cases}\frac{x^2}{d} & \text{for } e=0\\ \frac{\log(d+ex^2)}{e} & \text{otherwise}\end{cases}\right)}{2e^2}-\frac{adx^2}{2e^2}+\frac{ax^4}{4e}-\frac{bd^2n\left(\begin{cases}\frac{x^2}{2d} \\ \frac{\begin{cases}\log(d)\log(x)-\frac{\mathrm{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2}\\ -\log(d)\log\left(\frac{1}{x}\right)-\frac{\mathrm{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2}\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log(d)-\end{cases}}{e}\end{cases}\right)}{2e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] a*d**2*Piecewise((x**2/d, Eq(e, 0)), (log(d + e*x**2)/e, True))/(2*e**2) -
a*d*x**2/(2*e**2) + a*x**4/(4*e) - b*d**2*n*Piecewise((x**2/(2*d), Eq(e, 0)
), (Piecewise((log(d)*log(x) - polylog(2, e*x**2*exp_polar(I*pi)/d)/2, Abs(
x) < 1), (-log(d)*log(1/x) - polylog(2, e*x**2*exp_polar(I*pi)/d)/2, 1/Abs(
x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1),
 ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x**2*exp_polar(I*pi)/d)/2, Tru
e))/e, True))/(2*e**2) + b*d**2*Piecewise((x**2/d, Eq(e, 0)), (log(d + e*x*
*2)/e, True))*log(c*x**n)/(2*e**2) + b*d*n*x**2/(4*e**2) - b*d*x**2*log(c*x
**n)/(2*e**2) - b*n*x**4/(16*e) + b*x**4*log(c*x**n)/(4*e)
```

3.211 $\int \frac{x^3(a+b\log(cx^n))}{d+ex^2} dx$

Optimal. Leaf size=83

$$-\frac{d\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e}-\frac{bdn\text{Li}_2\left(-\frac{ex^2}{d}\right)}{4e^2}-\frac{bnx^2}{4e}$$

```
[Out] -1/4*b*n*x^2/e+1/2*x^2*(a+b*ln(c*x^n))/e-1/2*d*(a+b*ln(c*x^n))*ln(1+e*x^2/d
)/e^2-1/4*b*d*n*polylog(2,-e*x^2/d)/e^2
```

Rubi [A] time = 0.14, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2351, 2304, 2337, 2391}

$$-\frac{bdn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^2}-\frac{d\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e}-\frac{bnx^2}{4e}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] -(b*n*x^2)/(4*e) + (x^2*(a + b*Log[c*x^n]))/(2*e) - (d*(a + b*Log[c*x^n])*L
og[1 + (e*x^2)/d])/(2*e^2) - (b*d*n*PolyLog[2, -((e*x^2)/d)])/(4*e^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx=\int\left(\frac{x\left(a+b\log\left(cx^n\right)\right)}{e}-\frac{dx\left(a+b\log\left(cx^n\right)\right)}{e\left(d+ex^2\right)}\right)dx$$
$$=\frac{\int x\left(a+b\log\left(cx^n\right)\right)dx}{e}-\frac{d\int\frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx}{e}$$
$$=-\frac{bnx^2}{4e}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e}-\frac{d\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex^2}{d}\right)}{2e^2}+\frac{(bdn)\int\frac{\log\left(1+\frac{e}{\dots}\right.}{x}}{2e^2}$$
$$=-\frac{bnx^2}{4e}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e}-\frac{d\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex^2}{d}\right)}{2e^2}-\frac{bdn\mathrm{Li}_2\left(-\frac{ex^2}{d}\right)}{4e^2}$$

Mathematica [A] time = 0.07, size = 135, normalized size = 1.63

$$-\frac{2d\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)\left(a+b\log\left(cx^n\right)\right)+2d\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\left(a+b\log\left(cx^n\right)\right)-2ex^2\left(a+b\log\left(cx^n\right)\right)+2bdn\mathrm{Li}_2\left(\dots\right.}{4e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] -1/4*(b*e*n*x^2 - 2*e*x^2*(a + b*Log[c*x^n]) + 2*d*(a + b*Log[c*x^n])*Log[1
 + (Sqrt[e]*x)/Sqrt[-d]] + 2*d*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d
)^(3/2)] + 2*b*d*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]] + 2*b*d*n*PolyLog[2, (d
*Sqrt[e]*x)/(-d)^(3/2)])/e^2
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x^n) + a*x^3)/(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x^3}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^2 + d), x)
```

maple [C] time = 0.21, size = 460, normalized size = 5.54

$$-\frac{i\pi b\,x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{4e}+\frac{i\pi b\,x^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{4e}+\frac{i\pi b\,x^2\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{4e}-\frac{i\pi b\,x^2\mathrm{c}\dots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(e*x^2+d),x)
```

```
[Out] 1/2*b*ln(x^n)/e*x^2-1/2*b*ln(x^n)*d/e^2*ln(e*x^2+d)-1/4*b/e*n*x^2+1/2*b*n*d
/e^2*ln(x)*ln(e*x^2+d)-1/2*b*n*d/e^2*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1
/2))-1/2*b*n*d/e^2*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*d/e^2*
dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*d/e^2*dilog((e*x+(-d*e)^(1/
2))/(-d*e)^(1/2))+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x^2+1/4*I*b*Pi*csg
n(I*c*x^n)^3*d/e^2*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^2*l
n(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^2*ln(e*x^2+d)+1/4*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I
*c*x^n)^3/e*x^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e*x^2+1/4*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*x^2+1/2*b/e*x^2*ln(c)-1/2*b*ln(c)*d/e^2*
ln(e*x^2+d)+1/2*a/e*x^2-1/2*a*d/e^2*ln(e*x^2+d)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}a\left(\frac{x^2}{e} - \frac{d\log\left(ex^2+d\right)}{e^2}\right) + b\int \frac{x^3\log(c) + x^3\log\left(x^n\right)}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(x^2/e - d*log(e*x^2 + d)/e^2) + b*integrate((x^3*log(c) + x^3*log(x^
n))/(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x^2),x)
```

```
[Out] int((x^3*(a + b*log(c*x^n)))/(d + e*x^2), x)
```

sympy [A] time = 34.15, size = 180, normalized size = 2.17

$$-\frac{ad\left(\begin{cases}\frac{x^2}{d} & \text{for}\ e=0\\ \frac{\log\left(d+ex^2\right)}{e} & \text{otherwise}\end{cases}\right)}{2e} + \frac{ax^2}{2e} + \frac{bdn\left(\begin{cases}\frac{x^2}{2d} \\ \frac{\begin{cases}\log(d)\log(x) - \frac{\mathrm{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2} \\ -\log(d)\log\left(\frac{1}{x}\right) - \frac{\mathrm{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2} \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(d) + G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log(d) - \frac{\mathrm{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2}\end{cases}}{e}\end{cases}\right)}{2e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] -a*d*Piecewise((x**2/d, Eq(e, 0)), (log(d + e*x**2)/e, True))/(2*e) + a*x**
2/(2*e) + b*d*n*Piecewise((x**2/(2*d), Eq(e, 0)), (Piecewise((log(d)*log(x)
```

```
 - polylog(2, e*x**2*exp_polar(I*pi)/d)/2, Abs(x) < 1), (-log(d)*log(1/x) -
 polylog(2, e*x**2*exp_polar(I*pi)/d)/2, 1/Abs(x) < 1), (-meijerg(((), (1,
1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d
) - polylog(2, e*x**2*exp_polar(I*pi)/d)/2, True))/e, True))/(2*e) - b*d*Pi
ecewise((x**2/d, Eq(e, 0)), (log(d + e*x**2)/e, True))*log(c*x**n)/(2*e) -
b*n*x**2/(4*e) + b*x**2*log(c*x**n)/(2*e)
```

3.212 $\int \frac{x(a+b\log(cx^n))}{d+ex^2}\,dx$

Optimal. Leaf size=49

$$\frac{\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2e}+\frac{bn\text{Li}_2\left(-\frac{ex^2}{d}\right)}{4e}$$

```
[Out] 1/2*(a+b*ln(c*x^n))*ln(1+e*x^2/d)/e+1/4*b*n*polylog(2,-e*x^2/d)/e
```

Rubi [A] time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2337, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e}+\frac{\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2e}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] ((a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*e) + (b*n*PolyLog[2, -((e*x^2)/d
)])/(4*e)
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{x(a+b\log(cx^n))}{d+ex^2}\,dx &= \frac{(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right)}{2e}-\frac{(bn)\int \frac{\log\left(1+\frac{ex^2}{d}\right)}{x}\,dx}{2e}\\ &= \frac{(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right)}{2e}+\frac{bn\text{Li}_2\left(-\frac{ex^2}{d}\right)}{4e}\end{aligned}$$

Mathematica [A] time = 0.03, size = 94, normalized size = 1.92

$$\frac{\left(\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)+\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\right)(a+b\log(cx^n))+bn\text{Li}_2\left(\frac{\sqrt{e}x}{\sqrt{-d}}\right)+bn\text{Li}_2\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{2e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] ((a + b*Log[c*x^n])*(Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + Log[1 + (d*Sqrt[e]*x)/
(-d)^(3/2)]) + b*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]] + b*n*PolyLog[2, (d*Sqr
t[e]*x)/(-d)^(3/2)])/(2*e)
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx\log\left(cx^{n}\right)+ax}{ex^{2}+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x*log(c*x^n) + a*x)/(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^{n}\right)+a\right)x}{ex^{2}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^2 + d), x)
```

maple [C] time = 0.18, size = 299, normalized size = 6.10

$$-\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)\ln\left(e\,x^{2}+d\right)}{4e}+\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^{n}\right)^{2}\ln\left(e\,x^{2}+d\right)}{4e}+\frac{i\pi b\,\mathrm{csgn}\left(ix^{n}\right)\mathrm{csg}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x^2+d),x)
```

```
[Out] 1/2*b/e*ln(e*x^2+d)*ln(x^n)-1/2*b/e*n*ln(x)*ln(e*x^2+d)+1/2*b/e*n*ln(x)*ln(
(-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b/e*n*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d
*e)^(1/2))+1/2*b/e*n*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b/e*n*dilo
g((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*I/e*ln(e*x^2+d)*b*Pi*csgn(I*x^n)*csg
n(I*c*x^n)^2-1/4*I/e*ln(e*x^2+d)*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1
/4*I/e*ln(e*x^2+d)*b*Pi*csgn(I*c*x^n)^3+1/4*I/e*ln(e*x^2+d)*b*Pi*csgn(I*c*x
^n)^2*csgn(I*c)+1/2/e*ln(e*x^2+d)*b*ln(c)+1/2*a/e*ln(e*x^2+d)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b\int\frac{x\log(c)+x\log\left(x^{n}\right)}{ex^{2}+d}\,dx+\frac{a\log\left(ex^{2}+d\right)}{2\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] b*integrate((x*log(c) + x*log(x^n))/(e*x^2 + d), x) + 1/2*a*log(e*x^2 + d)/
e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int\frac{x\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{e\,x^{2}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x^2),x)
```

[Out] int((x*(a + b*log(c*x^n)))/(d + e*x^2), x)

sympy [A]   time = 7.83, size = 119, normalized size = 2.43

$$\frac{a\log\left(d+ex^2\right)}{2e}-\frac{bn\left(\begin{cases}\log(d)\log(x)-\frac{\operatorname{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2} & \text{for } |x|<1\\ -\log(d)\log\left(\frac{1}{x}\right)-\frac{\operatorname{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2} & \text{for } \frac{1}{|x|}<1\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log(d)-\frac{\operatorname{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2} & \text{otherwise}\end{cases}\right)}{2e}+\frac{b\log(c\!\!}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d),x)

[Out] a*log(d + e*x**2)/(2*e) - b*n*Piecewise((log(d)*log(x) - polylog(2, e*x**2*
exp_polar(I*pi)/d)/2, Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x**2*ex
p_polar(I*pi)/d)/2, 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)
*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x**2
*exp_polar(I*pi)/d)/2, True))/(2*e) + b*log(c*x**n)*log(d + e*x**2)/(2*e)

3.213 $\int \frac{a+b\log(cx^n)}{x\left(d+ex^2\right)}\,dx$

Optimal. Leaf size=49

$$\frac{bn\text{Li}_2\left(-\frac{d}{ex^2}\right)}{4d}-\frac{\log\left(\frac{d}{ex^2}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2d}$$

```
[Out] -1/2*ln(1+d/e/x^2)*(a+b*ln(c*x^n))/d+1/4*b*n*polylog(2,-d/e/x^2)/d
```

Rubi [A] time = 0.06, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2345, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{4d}-\frac{\log\left(\frac{d}{ex^2}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^2)),x]
```

```
[Out] -(Log[1 + d/(e*x^2)]*(a + b*Log[c*x^n]))/(2*d) + (b*n*PolyLog[2, -(d/(e*x^2
))])/(4*d)
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log\left(cx^n\right)}{x\left(d+ex^2\right)}\,dx &= -\frac{\log\left(1+\frac{d}{ex^2}\right)\left(a+b\log\left(cx^n\right)\right)}{2d}+\frac{(bn)\int \frac{\log\left(1+\frac{d}{ex^2}\right)}{x}\,dx}{2d}\\ &= -\frac{\log\left(1+\frac{d}{ex^2}\right)\left(a+b\log\left(cx^n\right)\right)}{2d}+\frac{bn\text{Li}_2\left(-\frac{d}{ex^2}\right)}{4d}\end{aligned}$$

Mathematica [B] time = 0.10, size = 126, normalized size = 2.57

$$-\frac{-\left(a+b\log\left(cx^n\right)\right)\left(a+b\log\left(cx^n\right)-bn\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)-bn\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\right)+b^2n^2\text{Li}_2\left(\frac{\sqrt{e}x}{\sqrt{-d}}\right)+b^2n^2\text{Li}_2\left(\frac{d}{(-\ldots}\right.}{2bdn}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^2)),x]
```

```
[Out] -1/2*(-((a + b*Log[c*x^n])*(a + b*Log[c*x^n] - b*n*Log[1 + (Sqrt[e]*x)/Sqrt
[-d]] - b*n*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])) + b^2*n^2*PolyLog[2, (Sqrt[
e]*x)/Sqrt[-d]] + b^2*n^2*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(b*d*n)
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{ex^{3}+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b*log(c*x^n) + a)/(e*x^3 + d*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\log\left(cx^{n}\right)+a}{\left(ex^{2}+d\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)*x), x)
```

maple [C] time = 0.19, size = 439, normalized size = 8.96

$$-\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)\ln(x)}{2d}+\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)\ln\left(e\,x^{2}+d\right)}{4d}+\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^2+d),x)
[Out] -1/2*b*ln(x^n)/d*ln(e*x^2+d)+b*ln(x^n)/d*ln(x)+1/2*b*n/d*ln(x)*ln(e*x^2+d)-
1/2*b*n/d*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n/d*ln(x)*ln((e*
x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n/d*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1
/2))-1/2*b*n/d*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b/d*n*ln(x)^2-1/2
*I*b*Pi*csgn(I*c*x^n)^3/d*ln(x)+1/4*I*b*Pi*csgn(I*c*x^n)^3/d*ln(e*x^2+d)-1/
4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*ln(e*x^2+d)+1/2*I*b*Pi*csgn(I*x^n)*csg
n(I*c*x^n)^2/d*ln(x)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*ln(e*
x^2+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*ln(x)-1/4*I*b*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)^2/d*ln(e*x^2+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)/d*ln(x)-1/2*b*ln(c)/d*ln(e*x^2+d)+b/d*ln(c)*ln(x)-1/2*a/d*ln(e*x^2+d)+a/d
*ln(x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a\left(\frac{\log\left(ex^{2}+d\right)}{d}-\frac{2\,\log(x)}{d}\right)+b\int\frac{\log(c)+\log\left(x^{n}\right)}{ex^{3}+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d),x, algorithm="maxima")
[Out] -1/2*a*(log(e*x^2 + d)/d - 2*log(x)/d) + b*integrate((log(c) + log(x^n))/(e
*x^3 + d*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int\frac{a+b\,\ln\left(c\,x^{n}\right)}{x\,\left(e\,x^{2}+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^2)),x)
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^2)), x)
```

sympy [A] time = 16.74, size = 124, normalized size = 2.53

$$\frac{a\log(x)}{d} - \frac{a\log\left(d+ex^2\right)}{2d} + \frac{bn\left(\begin{cases}\log(e)\log(x) + \frac{\operatorname{Li}_2\left(\frac{de^{i\pi}}{ex^2}\right)}{2} & \text{for } |x|<1 \\ -\log(e)\log\left(\frac{1}{x}\right) + \frac{\operatorname{Li}_2\left(\frac{de^{i\pi}}{ex^2}\right)}{2} & \text{for } \frac{1}{|x|}<1 \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(e) + G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix}\middle| x\right)\log(e) + \frac{\operatorname{Li}_2\left(\frac{de^{i\pi}}{ex^2}\right)}{2} & \text{otherwise}\end{cases}\right)}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x**2+d),x)
[Out] a*log(x)/d - a*log(d + e*x**2)/(2*d) + b*n*Piecewise((log(e)*log(x) + polyl
og(2, d*exp_polar(I*pi)/(e*x**2))/2, Abs(x) < 1), (-log(e)*log(1/x) + polyl
og(2, d*exp_polar(I*pi)/(e*x**2))/2, 1/Abs(x) < 1), (-meijerg(((), (1, 1)),
 ((0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) +
polylog(2, d*exp_polar(I*pi)/(e*x**2))/2, True))/(2*d) - b*log(c*x**n)*log(
d/x**2 + e)/(2*d)
```

3.214 $\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)} \, dx$

Optimal. Leaf size=83

$$\frac{e\log\left(\frac{d}{ex^2}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2d^2}-\frac{a+b\log\left(cx^n\right)}{2dx^2}-\frac{ben\text{Li}_2\left(-\frac{d}{ex^2}\right)}{4d^2}-\frac{bn}{4dx^2}$$

```
[Out] -1/4*b*n/d/x^2+1/2*(-a-b*ln(c*x^n))/d/x^2+1/2*e*ln(1+d/e/x^2)*(a+b*ln(c*x^n
))/d^2-1/4*b*e*n*polylog(2,-d/e/x^2)/d^2
```

Rubi [A] time = 0.18, antiderivative size = 109, normalized size of antiderivative = 1.31, number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {266, 44, 2351, 2304, 2301, 2337, 2391}

$$\frac{ben\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4d^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2bd^2n}+\frac{e\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2d^2}-\frac{a+b\log\left(cx^n\right)}{2dx^2}-\frac{bn}{4dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)),x]
```

```
[Out] -(b*n)/(4*d*x^2) - (a + b*Log[c*x^n])/(2*d*x^2) - (e*(a + b*Log[c*x^n])^2)/
(2*b*d^2*n) + (e*(a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*d^2) + (b*e*n*Po
lyLog[2, -((e*x^2)/d)])/(4*d^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)}\,dx=\int\left(\frac{a+b\log(cx^n)}{dx^3}-\frac{e\left(a+b\log(cx^n)\right)}{d^2x}+\frac{e^2x\left(a+b\log(cx^n)\right)}{d^2\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int\frac{a+b\log(cx^n)}{x^3}\,dx}{d}-\frac{e\int\frac{a+b\log(cx^n)}{x}\,dx}{d^2}+\frac{e^2\int\frac{x\left(a+b\log(cx^n)\right)}{d+ex^2}\,dx}{d^2}$$

$$=-\frac{bn}{4dx^2}-\frac{a+b\log(cx^n)}{2dx^2}-\frac{e\left(a+b\log(cx^n)\right)^2}{2bd^2n}+\frac{e\left(a+b\log(cx^n)\right)\log\left(1+\frac{ex^2}{d}\right)}{2d^2}-\frac{(bo}{}$$

$$=-\frac{bn}{4dx^2}-\frac{a+b\log(cx^n)}{2dx^2}-\frac{e\left(a+b\log(cx^n)\right)^2}{2bd^2n}+\frac{e\left(a+b\log(cx^n)\right)\log\left(1+\frac{ex^2}{d}\right)}{2d^2}+\frac{be}{}$$

Mathematica [A] time = 0.13, size = 157, normalized size = 1.89

$$\frac{2e\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)\left(a+b\log(cx^n)\right)+2e\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\left(a+b\log(cx^n)\right)-\frac{2d\left(a+b\log(cx^n)\right)}{x^2}-\frac{2e\left(a+b\log(cx^n)\right)^2}{bn}+2b}{4d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)),x]
```

```
[Out] (-((b*d*n)/x^2) - (2*d*(a + b*Log[c*x^n]))/x^2 - (2*e*(a + b*Log[c*x^n])^2)
/(b*n) + 2*e*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + 2*e*(a + b*
Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + 2*b*e*n*PolyLog[2, (Sqrt[e]
*x)/Sqrt[-d]] + 2*b*e*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(4*d^2)
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{b\log(cx^n)+a}{ex^5+dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^5 + d*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\log(cx^n)+a}{\left(ex^2+d\right)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)*x^3), x)
```

maple [C] time = 0.19, size = 611, normalized size = 7.36

$$\frac{ben\,\mathrm{dilog}\left(\frac{-ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2d^2}+\frac{ben\,\mathrm{dilog}\left(\frac{ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2d^2}+\frac{be\ln(x^n)\ln\left(e\,x^2+d\right)}{2d^2}-\frac{be\ln(x)\ln(x^n)}{d^2}+\frac{be\ln(c)\ln\left(e\,x^2+d\right)}{2d^2}+\frac{ben}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(e*x^2+d),x)
```

```
[Out] 1/2*b*ln(x^n)*e/d^2*ln(e*x^2+d)-b*ln(x^n)*e/d^2*ln(x)+1/2*b*ln(c)*e/d^2*ln(
e*x^2+d)+1/2*b*n*e/d^2*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*e/d^
2*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b/d^2*e*n*ln(x)^2-b/d^2*e*ln(c
)*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2*ln(x)+1/4*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)^2*e/d^2*ln(e*x^2+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
*e/d^2*ln(e*x^2+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2*ln(x)+1/4*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/x^2+1/4*I*b*Pi*csgn(I*c*x^n)^3/
d/x^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2*ln(e*x^2+d)-1/2*
b/d/x^2*ln(x^n)-1/2*b*n*e/d^2*ln(x)*ln(e*x^2+d)+1/2*b*n*e/d^2*ln(x)*ln((-e*
x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*e/d^2*ln(x)-1/2*b/d/x^2*ln(c)+1/2*a*e/d^2*ln(e*x^2+d)-1/2*a/d/x^2+1/2*b*n
*e/d^2*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-a/d^2*e*ln(x)+1/2*I*b*Pi*c
sgn(I*c*x^n)^3*e/d^2*ln(x)-1/4*b/d*n/x^2-1/4*I*b*Pi*csgn(I*c*x^n)^3*e/d^2*l
n(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/x^2-1/4*I*b*Pi*csgn(I*c
*x^n)^2*csgn(I*c)/d/x^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{e\log\left(ex^2+d\right)}{d^2}-\frac{2\,e\log(x)}{d^2}-\frac{1}{dx^2}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{ex^5+dx^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(e*log(e*x^2 + d)/d^2 - 2*e*log(x)/d^2 - 1/(d*x^2)) + b*integrate((lo
g(c) + log(x^n))/(e*x^5 + d*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(e*x**2+d),x)
```

```
[Out] Timed out
```

3.215 $\int \frac{a+b\log(cx^n)}{x^5(d+ex^2)}\,dx$

Optimal. Leaf size=121

$$-\frac{e^2\log\left(\frac{d}{ex^2}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2d^3}+\frac{e\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2}-\frac{a+b\log\left(cx^n\right)}{4dx^4}+\frac{be^2n\text{Li}_2\left(-\frac{d}{ex^2}\right)}{4d^3}+\frac{ben}{4d^2x^2}-\frac{bn}{16dx^4}$$

```
[Out] -1/16*b*n/d/x^4+1/4*b*e*n/d^2/x^2+1/4*(-a-b*ln(c*x^n))/d/x^4+1/2*e*(a+b*ln(
c*x^n))/d^2/x^2-1/2*e^2*ln(1+d/e/x^2)*(a+b*ln(c*x^n))/d^3+1/4*b*e^2*n*polyl
og(2,-d/e/x^2)/d^3
```

Rubi [A] time = 0.21, antiderivative size = 149, normalized size of antiderivative = 1.23, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {266, 44, 2351, 2304, 2301, 2337, 2391}

$$-\frac{be^2n\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4d^3}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{2bd^3n}-\frac{e^2\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2d^3}+\frac{e\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2}-\frac{a+b\log}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^5*(d + e*x^2)),x]
```

```
[Out] -(b*n)/(16*d*x^4) + (b*e*n)/(4*d^2*x^2) - (a + b*Log[c*x^n])/(4*d*x^4) + (e
*(a + b*Log[c*x^n]))/(2*d^2*x^2) + (e^2*(a + b*Log[c*x^n])^2)/(2*b*d^3*n) -
 (e^2*(a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*d^3) - (b*e^2*n*PolyLog[2,
-((e*x^2)/d)])/(4*d^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^5(d+ex^2)}\,dx = \int \left(\frac{a+b\log(cx^n)}{dx^5} - \frac{e(a+b\log(cx^n))}{d^2x^3} + \frac{e^2(a+b\log(cx^n))}{d^3x} - \frac{e^3x(a+b\log(cx^n))}{d^3(d+ex^2)}\right) dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^5}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d^2} + \frac{e^2\int \frac{a+b\log(cx^n)}{x}\,dx}{d^3} - \frac{e^3\int \frac{x(a+b\log(cx^n))}{d+ex^2}\,dx}{d^3}$$

$$= -\frac{bn}{16dx^4} + \frac{ben}{4d^2x^2} - \frac{a+b\log(cx^n)}{4dx^4} + \frac{e(a+b\log(cx^n))}{2d^2x^2} + \frac{e^2(a+b\log(cx^n))^2}{2bd^3n} - \frac{e^2(a+ \cdots}{\cdots}$$

$$= -\frac{bn}{16dx^4} + \frac{ben}{4d^2x^2} - \frac{a+b\log(cx^n)}{4dx^4} + \frac{e(a+b\log(cx^n))}{2d^2x^2} + \frac{e^2(a+b\log(cx^n))^2}{2bd^3n} - \frac{e^2(a+ \cdots}{\cdots}$$

Mathematica [A] time = 0.20, size = 196, normalized size = 1.62

$$-\frac{\frac{4d^2(a+b\log(cx^n))}{x^4} + 8e^2\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n)) + 8e^2\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)(a+b\log(cx^n)) - \frac{8de(a+b\log(cx^n))}{x^2} - \cdots}{16d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^5*(d + e*x^2)),x]
```

```
[Out] -1/16*((b*d^2*n)/x^4 - (4*b*d*e*n)/x^2 + (4*d^2*(a + b*Log[c*x^n]))/x^4 - (
8*d*e*(a + b*Log[c*x^n]))/x^2 - (8*e^2*(a + b*Log[c*x^n])^2)/(b*n) + 8*e^2*
(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + 8*e^2*(a + b*Log[c*x^n])
*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + 8*b*e^2*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[
-d]] + 8*b*e^2*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/d^3
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{ex^7+dx^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^5/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^7 + d*x^5), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{(ex^2+d)x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^5/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)*x^5), x)
```

maple [C] time = 0.21, size = 805, normalized size = 6.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^5/(e*x^2+d),x)
```

```
[Out] -1/2*b*ln(c)*e^2/d^3*ln(e*x^2+d)-1/2*b*n*e^2/d^3*dilog((-e*x+(-d*e)^(1/2))/
(-d*e)^(1/2))-1/2*b*n*e^2/d^3*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+b/d^3*
e^2*ln(x)*ln(x^n)+b/d^3*e^2*ln(c)*ln(x)-1/2*b/d^3*e^2*n*ln(x)^2+1/2*b/d^2*e
/x^2*ln(c)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3*ln(e*x^2+d)-1/4*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/x^2+1/2*I*b*Pi*csgn(I*c*x^n
)^2*csgn(I*c)*e^2/d^3*ln(x)-1/2*b*ln(x^n)*e^2/d^3*ln(e*x^2+d)+1/2*b*ln(x^n)
*e/d^2/x^2-1/4*b*ln(x^n)/d/x^4-1/4*b*ln(c)/d/x^4+1/2*I*b*Pi*csgn(I*x^n)*csg
n(I*c*x^n)^2*e^2/d^3*ln(x)-1/2*a*e^2/d^3*ln(e*x^2+d)+1/8*I*b*Pi*csgn(I*c*x^
n)^3/d/x^4-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3*ln(e*x^2+d)+1/2*a/d
^2*e/x^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2/x^2+1/2*b*n*e^2/d^3*l
n(x)*ln(e*x^2+d)+a/d^3*e^2*ln(x)-1/2*b*n*e^2/d^3*ln(x)*ln((-e*x+(-d*e)^(1/2
))/(-d*e)^(1/2))-1/2*b*n*e^2/d^3*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-
1/4*a/d/x^4+1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/x^4+1/4*I*b*Pi
*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/x^2-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)*e^2/d^3*ln(x)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d
^3*ln(e*x^2+d)-1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/x^4+1/4*I*b*Pi*csgn
(I*c*x^n)^3*e^2/d^3*ln(e*x^2+d)-1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x^4-
1/16*b*n/d/x^4-1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3*ln(x)-1/4*I*b*Pi*csgn(I*c
*x^n)^3*e/d^2/x^2+1/4*b/d^2*e*n/x^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{4}\,a\left(\frac{2\,e^2\log\left(ex^2+d\right)}{d^3}-\frac{4\,e^2\log(x)}{d^3}-\frac{2\,ex^2-d}{d^2x^4}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{ex^7+dx^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^5/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*e^2*log(e*x^2 + d)/d^3 - 4*e^2*log(x)/d^3 - (2*e*x^2 - d)/(d^2*x^
4)) + b*integrate((log(c) + log(x^n))/(e*x^7 + d*x^5), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^n\right)}{x^5\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^5*(d + e*x^2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^5*(d + e*x^2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**5/(e*x**2+d),x)
```

```
[Out] Timed out
```

3.216 $\int \frac{x^4(a+b\log(cx^n))}{d+ex^2}\,dx$

Optimal. Leaf size=167

$$\frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{5/2}}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e}-\frac{adx}{e^2}-\frac{bdx\log\left(cx^n\right)}{e^2}-\frac{ibd^{3/2}n\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}+\frac{ibd^{3/2}n\text{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}$$

```
[Out] -a*d*x/e^2+b*d*n*x/e^2-1/9*b*n*x^3/e-b*d*x*ln(c*x^n)/e^2+1/3*x^3*(a+b*ln(c*
x^n))/e+d^(3/2)*arctan(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/e^(5/2)-1/2*I*b*d
^(3/2)*n*polylog(2,-I*x*e^(1/2)/d^(1/2))/e^(5/2)+1/2*I*b*d^(3/2)*n*polylog(
2,I*x*e^(1/2)/d^(1/2))/e^(5/2)
```

Rubi [A] time = 0.21, antiderivative size = 167, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {302, 205, 2351, 2295, 2304, 2324, 12, 4848, 2391}

$$-\frac{ibd^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}+\frac{ibd^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}+\frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{5/2}}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] -((a*d*x)/e^2) + (b*d*n*x)/e^2 - (b*n*x^3)/(9*e) - (b*d*x*Log[c*x^n])/e^2 +
 (x^3*(a + b*Log[c*x^n]))/(3*e) + (d^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a +
 b*Log[c*x^n]))/e^(5/2) - ((I/2)*b*d^(3/2)*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sq
rt[d]])/e^(5/2) + ((I/2)*b*d^(3/2)*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/e^(
5/2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{x^4\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx = \int \left(-\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{e}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)}\right)dx$$

$$= -\frac{d\int\left(a+b\log\left(cx^n\right)\right)\,dx}{e^2}+\frac{d^2\int\frac{a+b\log(cx^n)}{d+ex^2}\,dx}{e^2}+\frac{\int x^2\left(a+b\log\left(cx^n\right)\right)\,dx}{e}$$

$$= -\frac{adx}{e^2}-\frac{bnx^3}{9e}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e}+\frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{5/2}}-\frac{(bd)\int$$

$$= -\frac{adx}{e^2}+\frac{bdnx}{e^2}-\frac{bnx^3}{9e}-\frac{bdx\log\left(cx^n\right)}{e^2}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e}+\frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(}{e^{5/2}}$$

$$= -\frac{adx}{e^2}+\frac{bdnx}{e^2}-\frac{bnx^3}{9e}-\frac{bdx\log\left(cx^n\right)}{e^2}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e}+\frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(}{e^{5/2}}$$

$$= -\frac{adx}{e^2}+\frac{bdnx}{e^2}-\frac{bnx^3}{9e}-\frac{bdx\log\left(cx^n\right)}{e^2}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e}+\frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(}{e^{5/2}}$$

Mathematica [A] time = 0.16, size = 208, normalized size = 1.25

$$\frac{9\sqrt{-d}\,d\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)\left(a+b\log\left(cx^n\right)\right)+9(-d)^{3/2}\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\left(a+b\log\left(cx^n\right)\right)+6e^{3/2}x^3\left(a+b\log\left(cx^n\right)\right)}{18e^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] (-18*a*d*Sqrt[e]*x + 18*b*d*Sqrt[e]*n*x - 2*b*e^(3/2)*n*x^3 - 18*b*d*Sqrt[e
]*x*Log[c*x^n] + 6*e^(3/2)*x^3*(a + b*Log[c*x^n]) + 9*Sqrt[-d]*d*(a + b*Log
[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + 9*(-d)^(3/2)*(a + b*Log[c*x^n])*Lo
```

```
g[1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + 9*b*(-d)^(3/2)*n*PolyLog[2, (Sqrt[e]*x)/S
qrt[-d]] - 9*b*(-d)^(3/2)*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(18*e^(5/
2))
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^4\log(cx^n) + ax^4}{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*log(c*x^n) + a*x^4)/(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\log(cx^n) + a)x^4}{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^4/(e*x^2 + d), x)
```

maple [C] time = 0.24, size = 693, normalized size = 4.15

$$-\frac{bdx\ln(x^n)}{e^2}+\frac{a\,x^3}{3e}+\frac{a\,d^2\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\;e^2}-\frac{i\pi b\,x^3\mathrm{csgn}(ic\,x^n)^3}{6e}+\frac{b\,d^2n\,\mathrm{dilog}\left(\frac{-ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2\sqrt{-de}\;e^2}-\frac{b\,d^2n\,\mathrm{dilog}\left(\frac{ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2\sqrt{-de}\;e^2}-\frac{b\,d^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(b*ln(c*x^n)+a)/(e*x^2+d),x)
```

```
[Out] -b*ln(x^n)/e^2*x*d+1/3*a/e*x^3+a*d^2/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2)
)-1/2*b*n*d^2/e^2/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-b*
d/e^2*x*ln(c)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^2/e^2/(d*e)^(1/2)*ar
ctan(x*e/(d*e)^(1/2))+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*x*
d-1/6*I*b*Pi*csgn(I*c*x^n)^3/e*x^3+b*d^2/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(
1/2))*ln(x^n)+1/2*b*n*d^2/e^2/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)
^(1/2))-1/2*b*n*d^2/e^2/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))
-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^2/(d*e)^(1/2)*arctan(
x*e/(d*e)^(1/2))+b*ln(c)*d^2/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/2*I*
b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*x*d+1/3*b/e*x^3*ln(c)-b*d^2/e^2/(d*e)^(1
/2)*arctan(x*e/(d*e)^(1/2))*n*ln(x)+1/2*b*n*d^2/e^2/(-d*e)^(1/2)*ln(x)*ln((
-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)/e*x^3+1/3*b/e*x^3*ln(x^n)-1/2*I*b*Pi*csgn(I*c*x^n)^3*d^2/e^2/(d*e)^(1/
2)*arctan(x*e/(d*e)^(1/2))-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*x*d+1
/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1
/2))-1/9*b/e*n*x^3+1/2*I*b*Pi*csgn(I*c*x^n)^3/e^2*x*d+1/6*I*b*Pi*csgn(I*c*x
^n)^2*csgn(I*c)/e*x^3+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*x^3+b*d/e^2*
n*x-a*d/e^2*x
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}a\left(\frac{3\,d^2\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,e^2} + \frac{ex^3 - 3\,dx}{e^2}\right) + b\int \frac{x^4\log(c) + x^4\log(x^n)}{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/3*a*(3*d^2*arctan(e*x/sqrt(d*e))/(sqrt(d*e)*e^2) + (e*x^3 - 3*d*x)/e^2) +
 b*integrate((x^4*log(c) + x^4*log(x^n))/(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*log(c*x^n)))/(d + e*x^2),x)
```

```
[Out] int((x^4*(a + b*log(c*x^n)))/(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] Integral(x**4*(a + b*log(c*x**n))/(d + e*x**2), x)
```

3.217 $\int \frac{x^2(a+b\log(cx^n))}{d+ex^2}\,dx$

Optimal. Leaf size=132

$$-\frac{\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}}+\frac{ax}{e}+\frac{bx\log\left(cx^n\right)}{e}+\frac{ib\sqrt{d}\,n\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{3/2}}-\frac{ib\sqrt{d}\,n\text{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{3/2}}-\frac{bnx}{e}$$

```
[Out] a*x/e-b*n*x/e+b*x*ln(c*x^n)/e-arctan(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*d^(
1/2)/e^(3/2)+1/2*I*b*n*polylog(2,-I*x*e^(1/2)/d^(1/2))*d^(1/2)/e^(3/2)-1/2*
I*b*n*polylog(2,I*x*e^(1/2)/d^(1/2))*d^(1/2)/e^(3/2)
```

Rubi [A] time = 0.16, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {321, 205, 2351, 2295, 2324, 12, 4848, 2391}

$$\frac{ib\sqrt{d}\,n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{3/2}}-\frac{ib\sqrt{d}\,n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{3/2}}-\frac{\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}}+\frac{ax}{e}+\frac{bx\log\left(cx^n\right)}{e}-\frac{bnx}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] (a*x)/e - (b*n*x)/e + (b*x*Log[c*x^n])/e - (Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt
[d]]*(a + b*Log[c*x^n]))/e^(3/2) + ((I/2)*b*Sqrt[d]*n*PolyLog[2, ((-I)*Sqrt
[e]*x)/Sqrt[d]])/e^(3/2) - ((I/2)*b*Sqrt[d]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt
[d]])/e^(3/2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx=\int\left(\frac{a+b\log\left(cx^n\right)}{e}-\frac{d\left(a+b\log\left(cx^n\right)\right)}{e\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int\left(a+b\log\left(cx^n\right)\right)dx}{e}-\frac{d\int\frac{a+b\log(cx^n)}{d+ex^2}\,dx}{e}$$

$$=\frac{ax}{e}-\frac{\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}}+\frac{b\int\log\left(cx^n\right)dx}{e}+\frac{(bdn)\int\frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{\sqrt{d}\,\sqrt{e}\,x}\,dx}{e}$$

$$=\frac{ax}{e}-\frac{bnx}{e}+\frac{bx\log\left(cx^n\right)}{e}-\frac{\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}}+\frac{\left(b\sqrt{d}\,n\right)\int\frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{x}}{e^{3/2}}$$

$$=\frac{ax}{e}-\frac{bnx}{e}+\frac{bx\log\left(cx^n\right)}{e}-\frac{\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}}+\frac{\left(ib\sqrt{d}\,n\right)\int\frac{\log\left(1-\ldots\right)}{x}}{2e^{3/2}}$$

$$=\frac{ax}{e}-\frac{bnx}{e}+\frac{bx\log\left(cx^n\right)}{e}-\frac{\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}}+\frac{ib\sqrt{d}\,n\mathrm{Li}_2\left(-\frac{i\sqrt{e}\,x}{\sqrt{d}}\ldots\right)}{2e^{3/2}}$$

Mathematica [A] time = 0.11, size = 170, normalized size = 1.29

$$\frac{-\sqrt{-d}\,\log\left(\frac{\sqrt{e}\,x}{\sqrt{-d}}+1\right)\left(a+b\log\left(cx^n\right)\right)+\sqrt{-d}\,\log\left(\frac{d\sqrt{e}\,x}{(-d)^{3/2}}+1\right)\left(a+b\log\left(cx^n\right)\right)+2a\sqrt{e}\,x+2b\sqrt{e}\,x\log\left(cx^n\right)+\ldots}{2e^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] (2*a*Sqrt[e]*x - 2*b*Sqrt[e]*n*x + 2*b*Sqrt[e]*x*Log[c*x^n] - Sqrt[-d]*(a +
 b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + Sqrt[-d]*(a + b*Log[c*x^n])*
Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + b*Sqrt[-d]*n*PolyLog[2, (Sqrt[e]*x)/Sqr
t[-d]] - b*Sqrt[-d]*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(2*e^(3/2))
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\log\left(cx^n\right)+ax^2}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log \left(cx^{n}\right) + a\right)x^{2}}{ex^{2} + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^2 + d), x)
```

maple [C] time = 0.24, size = 512, normalized size = 3.88

$$\frac{i\pi bd \arctan\left(\frac{ex}{\sqrt{de}}\right) \operatorname{csgn}\left(ic\right) \operatorname{csgn}\left(ix^{n}\right) \operatorname{csgn}\left(ic\, x^{n}\right)}{2\sqrt{de}\; e} - \frac{i\pi bd \arctan\left(\frac{ex}{\sqrt{de}}\right) \operatorname{csgn}\left(ic\right) \operatorname{csgn}\left(ic\, x^{n}\right)^{2}}{2\sqrt{de}\; e} - \frac{i\pi bd \arctan\left(\frac{ex}{\sqrt{de}}\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(e*x^2+d),x)
```

```
[Out] b*ln(x^n)/e*x+b*d/e/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*n*ln(x)-b*d/e/(d*
e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*ln(x^n)-b/e*n*x-1/2*b*n*d/e/(-d*e)^(1/2)
*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*d/e/(-d*e)^(1/2)*ln(x)*
ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*d/e/(-d*e)^(1/2)*dilog((-e*x+(-
d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*d/e/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))
/(-d*e)^(1/2))-1/2*I*b*Pi*csgn(I*c*x^n)^3/e*x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)/e*x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e/(d*e)^(1/2
)*arctan(1/(d*e)^(1/2)*e*x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*x+1/2*
I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e/(d*e)^(1/2)*arctan(1/(d*e)^(
1/2)*e*x)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x+1/2*I*b*Pi*csgn(I*c*x^n)
^3*d/e/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csg
n(I*c)*d/e/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+b/e*x*ln(c)-b*ln(c)*d/e/(d
*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+a/e*x-a*d/e/(d*e)^(1/2)*arctan(1/(d*e)^
(1/2)*e*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a\left(\frac{d \arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\, e} - \frac{x}{e}\right) + b \int \frac{x^{2} \log(c) + x^{2} \log\left(x^{n}\right)}{ex^{2} + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -a*(d*arctan(e*x/sqrt(d*e))/(sqrt(d*e)*e) - x/e) + b*integrate((x^2*log(c)
+ x^2*log(x^n))/(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^{2}\,\left(a + b\,\ln\left(c\,x^{n}\right)\right)}{e\,x^{2} + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2),x)
```

```
[Out] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \left(a + b \log \left(cx^n\right)\right)}{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))/(d + e*x**2), x)
```

3.218 $\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx$

Optimal. Leaf size=105

$$\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\sqrt{e}}-\frac{ibn\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}}+\frac{ibn\text{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}}$$

```
[Out] arctan(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/d^(1/2)/e^(1/2)-1/2*I*b*n*polylog
(2,-I*x*e^(1/2)/d^(1/2))/d^(1/2)/e^(1/2)+1/2*I*b*n*polylog(2,I*x*e^(1/2)/d^
(1/2))/d^(1/2)/e^(1/2)
```

Rubi [A] time = 0.07, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {205, 2324, 12, 4848, 2391}

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^2),x]
```

```
[Out] (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(Sqrt[d]*Sqrt[e]) - ((I/2)
*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*Sqrt[e]) + ((I/2)*b*n*P
olyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*Sqrt[e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx = \frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\sqrt{e}} - (bn)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}\,x}\,dx$$
$$= \frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\sqrt{e}} - \frac{(bn)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{x}\,dx}{\sqrt{d}\sqrt{e}}$$
$$= \frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\sqrt{e}} - \frac{(ibn)\int \frac{\log\left(1-\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)}{x}\,dx}{2\sqrt{d}\sqrt{e}} + \frac{(ibn)\int \frac{\log\left(1+\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)}{x}\,dx}{2\sqrt{d}\sqrt{e}}$$
$$= \frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\sqrt{e}} - \frac{ibn\mathrm{Li}_2\left(-\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}} + \frac{ibn\mathrm{Li}_2\left(\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}}$$

Mathematica [A] time = 0.05, size = 107, normalized size = 1.02

$$\frac{-\left(\left(\log\left(\frac{\sqrt{e}\,x}{\sqrt{-d}}+1\right)-\log\left(\frac{d\sqrt{e}\,x}{(-d)^{3/2}}+1\right)\right)\left(a+b\log(cx^n)\right)\right)+bn\mathrm{Li}_2\left(\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)-bn\mathrm{Li}_2\left(\frac{d\sqrt{e}\,x}{(-d)^{3/2}}\right)}{2\sqrt{-d}\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^2),x]
```

```
[Out] (-((a + b*Log[c*x^n])*(Log[1 + (Sqrt[e]*x)/Sqrt[-d]] - Log[1 + (d*Sqrt[e]*x
)/(-d)^(3/2)])) + b*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]] - b*n*PolyLog[2, (d*
Sqrt[e]*x)/(-d)^(3/2)])/(2*Sqrt[-d]*Sqrt[e])
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{ex^2+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^2 + d), x)
```

maple [C] time = 0.27, size = 332, normalized size = 3.16

$$-\frac{i\pi b\arctan\left(\frac{ex}{\sqrt{de}}\right)\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)}{2\sqrt{de}}+\frac{i\pi b\arctan\left(\frac{ex}{\sqrt{de}}\right)\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2}{2\sqrt{de}}+\frac{i\pi b\arctan\left(\frac{ex}{\sqrt{de}}\right)\dots}{\dots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x^2+d),x)
```

```
[Out] -b/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*n*ln(x)+b/(d*e)^(1/2)*arctan(1/(d*
e)^(1/2)*e*x)*ln(x^n)+1/2*b*n/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d
*e)^(1/2))-1/2*b*n/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1
/2*b*n/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n/(-d*e)^
(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*I/(d*e)^(1/2)*arctan(1/(d*
e)^(1/2)*e*x)*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I/(d*e)^(1/2)*arctan(1/(
d*e)^(1/2)*e*x)*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I/(d*e)^(1/2)*
arctan(1/(d*e)^(1/2)*e*x)*b*Pi*csgn(I*c*x^n)^3+1/2*I/(d*e)^(1/2)*arctan(1/(
d*e)^(1/2)*e*x)*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/(d*e)^(1/2)*arctan(1/(d*e)
^(1/2)*e*x)*b*ln(c)+a/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b \int \frac{\log(c) + \log(x^n)}{ex^2 + d}\, dx + \frac{a \arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] b*integrate((log(c) + log(x^n))/(e*x^2 + d), x) + a*arctan(e*x/sqrt(d*e))/s
qrt(d*e)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\ln\left(c\,x^n\right)}{e\,x^2 + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x^2),x)
```

```
[Out] int((a + b*log(c*x^n))/(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \log\left(cx^n\right)}{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(d + e*x**2), x)
```

3.219 $\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)}\,dx$

Optimal. Leaf size=134

$$-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}}-\frac{a+b\log(cx^n)}{dx}+\frac{ib\sqrt{e}n\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{ib\sqrt{e}n\text{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{bn}{dx}$$

```
[Out] -b*n/d/x+(-a-b*ln(c*x^n))/d/x-arctan(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*e^(
1/2)/d^(3/2)+1/2*I*b*n*polylog(2,-I*x*e^(1/2)/d^(1/2))*e^(1/2)/d^(3/2)-1/2*
I*b*n*polylog(2,I*x*e^(1/2)/d^(1/2))*e^(1/2)/d^(3/2)
```

Rubi [A] time = 0.17, antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$\frac{ib\sqrt{e}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{ib\sqrt{e}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}}-\frac{a+b\log(cx^n)}{dx}-\frac{bn}{dx}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)),x]
```

```
[Out] -((b*n)/(d*x)) - (a + b*Log[c*x^n])/(d*x) - (Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqr
t[d]]*(a + b*Log[c*x^n]))/d^(3/2) + ((I/2)*b*Sqrt[e]*n*PolyLog[2, ((-I)*Sqr
t[e]*x)/Sqrt[d]])/d^(3/2) - ((I/2)*b*Sqrt[e]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqr
t[d]])/d^(3/2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)}\,dx = \int \left(\frac{a+b\log(cx^n)}{dx^2} - \frac{e\left(a+b\log(cx^n)\right)}{d\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{d}$$

$$= -\frac{bn}{dx} - \frac{a+b\log(cx^n)}{dx} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{3/2}} + \frac{(ben)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}x}\,dx}{d}$$

$$= -\frac{bn}{dx} - \frac{a+b\log(cx^n)}{dx} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{3/2}} + \frac{\left(b\sqrt{e}n\right)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{d^{3/2}}$$

$$= -\frac{bn}{dx} - \frac{a+b\log(cx^n)}{dx} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{3/2}} + \frac{\left(ib\sqrt{e}n\right)\int \frac{\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{2d^{3/2}} - \cdots$$

$$= -\frac{bn}{dx} - \frac{a+b\log(cx^n)}{dx} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{3/2}} + \frac{ib\sqrt{e}n\,\mathrm{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}} - \frac{ib\sqrt{e}n \cdots}{2 \cdots}$$

Mathematica [A] time = 0.14, size = 173, normalized size = 1.29

$$\frac{d\left(-d\sqrt{e}x\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)\left(a+b\log(cx^n)\right) + d\sqrt{e}x\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\left(a+b\log(cx^n)\right) + 2d\sqrt{-d}\left(a+b\log(cx^n)\right) + \cdots}{2(-d)^{7/2}x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)),x]
```

```
[Out] (d*(-2*b*(-d)^(3/2)*n + 2*Sqrt[-d]*d*(a + b*Log[c*x^n]) - d*Sqrt[e]*x*(a +
b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + d*Sqrt[e]*x*(a + b*Log[c*x^n]
)*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + b*d*Sqrt[e]*n*x*PolyLog[2, (Sqrt[e]*x
)/Sqrt[-d]] - b*d*Sqrt[e]*n*x*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)]))/(2*(-d
)^(7/2)*x)
```

fricas [F] time = 0.68, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{ex^4+dx^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^4 + d*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right) + a}{\left(ex^2 + d\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)*x^2), x)
```

maple [C] time = 0.29, size = 531, normalized size = 3.96

$$\frac{i\pi be\arctan\left(\frac{ex}{\sqrt{de}}\right)\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)}{2\sqrt{de}\;d}-\frac{i\pi be\arctan\left(\frac{ex}{\sqrt{de}}\right)\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2}{2\sqrt{de}\;d}-\frac{i\pi be\arctan\left(\frac{e}{\sqrt{}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(e*x^2+d),x)
```

```
[Out] -b*ln(x^n)/d/x+b*e/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*n*ln(x)-b*e/d/(d
*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*ln(x^n)-b/d*n/x-1/2*b*n*e/d/(-d*e)^(1/2
)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*e/d/(-d*e)^(1/2)*ln(x)
*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*e/d/(-d*e)^(1/2)*dilog((-e*x+(
-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*e/d/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2)
)/(-d*e)^(1/2))+1/2*I*b*Pi*csgn(I*c*x^n)^3/d/x-1/2*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)^2/d/x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/x-1/2*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/2
*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x+1/2*I*b*Pi*csgn(I*c*x^n)^3*e/d/(d*e)^
(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d/(d
*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*e/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-b/d/x*ln(c)-b*ln(c)*e/d/(
d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-a/d/x-a*e/d/(d*e)^(1/2)*arctan(1/(d*e)
^(1/2)*e*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a\left(\frac{e\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d} + \frac{1}{dx}\right) + b\int \frac{\log(c) + \log\left(x^n\right)}{ex^4 + dx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -a*(e*arctan(e*x/sqrt(d*e))/(sqrt(d*e)*d) + 1/(d*x)) + b*integrate((log(c)
+ log(x^n))/(e*x^4 + d*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^2\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)),x)
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \log (cx^n)}{x^2 \left(d + ex^2\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x**2+d),x)
[Out] Integral((a + b*log(c*x**n))/(x**2*(d + e*x**2)), x)
```

3.220 $\int \frac{a+b\log(cx^n)}{x^4\left(d+ex^2\right)}\,dx$

Optimal. Leaf size=165

$$\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{d^{5/2}}+\frac{e\left(a+b\log\left(cx^n\right)\right)}{d^2x}-\frac{a+b\log\left(cx^n\right)}{3dx^3}-\frac{ibe^{3/2}n\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}}+\frac{ibe^{3/2}n\text{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}}$$

```
[Out] -1/9*b*n/d/x^3+b*e*n/d^2/x+1/3*(-a-b*ln(c*x^n))/d/x^3+e*(a+b*ln(c*x^n))/d^2
/x+e^(3/2)*arctan(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/d^(5/2)-1/2*I*b*e^(3/2
)*n*polylog(2,-I*x*e^(1/2)/d^(1/2))/d^(5/2)+1/2*I*b*e^(3/2)*n*polylog(2,I*x
*e^(1/2)/d^(1/2))/d^(5/2)
```

Rubi [A] time = 0.20, antiderivative size = 165, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$-\frac{ibe^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}}+\frac{ibe^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}}+\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{d^{5/2}}+\frac{e\left(a+b\log\left(cx^n\right)\right)}{d^2x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)),x]
```

```
[Out] -(b*n)/(9*d*x^3) + (b*e*n)/(d^2*x) - (a + b*Log[c*x^n])/(3*d*x^3) + (e*(a +
 b*Log[c*x^n]))/(d^2*x) + (e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c
*x^n]))/d^(5/2) - ((I/2)*b*e^(3/2)*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/
d^(5/2) + ((I/2)*b*e^(3/2)*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/d^(5/2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4\left(d+ex^2\right)}dx = \int \left(\frac{a+b\log(cx^n)}{dx^4} - \frac{e\left(a+b\log(cx^n)\right)}{d^2x^2} + \frac{e^2\left(a+b\log(cx^n)\right)}{d^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^4}dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{x^2}dx}{d^2} + \frac{e^2\int \frac{a+b\log(cx^n)}{d+ex^2}dx}{d^2}$$

$$= -\frac{bn}{9dx^3} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e\left(a+b\log(cx^n)\right)}{d^2x} + \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{5/2}}$$

$$= -\frac{bn}{9dx^3} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e\left(a+b\log(cx^n)\right)}{d^2x} + \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{5/2}}$$

$$= -\frac{bn}{9dx^3} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e\left(a+b\log(cx^n)\right)}{d^2x} + \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{5/2}}$$

$$= -\frac{bn}{9dx^3} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e\left(a+b\log(cx^n)\right)}{d^2x} + \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{d^{5/2}}$$

Mathematica [A] time = 0.18, size = 211, normalized size = 1.28

$$\frac{1}{18}\left(\frac{18e\left(a+b\log(cx^n)\right)}{d^2x} - \frac{9e^{3/2}\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)\left(a+b\log(cx^n)\right)}{(-d)^{5/2}} + \frac{9e^{3/2}\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\left(a+b\log(cx^n)\right)}{(-d)^{5/2}} - \frac{6\left(a\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)),x]
```

```
[Out] ((-2*b*n)/(d*x^3) + (18*b*e*n)/(d^2*x) - (6*(a + b*Log[c*x^n]))/(d*x^3) + (
18*e*(a + b*Log[c*x^n]))/(d^2*x) - (9*e^(3/2)*(a + b*Log[c*x^n])*Log[1 + (S
qrt[e]*x)/Sqrt[-d]])/(-d)^(5/2) + (9*e^(3/2)*(a + b*Log[c*x^n])*Log[1 + (d*
Sqrt[e]*x)/(-d)^(3/2)]])/(-d)^(5/2) + (9*b*e^(3/2)*n*PolyLog[2, (Sqrt[e]*x)/
Sqrt[-d]])/(-d)^(5/2) - (9*b*e^(3/2)*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)]
)/(-d)^(5/2))/18
```

fricas [F]   time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{ex^{6}+dx^{4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^6 + d*x^4), x)
```

giac [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\log\left(cx^{n}\right)+a}{\left(ex^{2}+d\right)x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)*x^4), x)
```

maple [C]   time = 0.30, size = 706, normalized size = 4.28

$$\frac{a\,e^{2}\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d^{2}}+\frac{be\ln\left(x^{n}\right)}{d^{2}x}+\frac{be\ln(c)}{d^{2}x}+\frac{b\,e^{2}n\,\mathrm{dilog}\left(\frac{-ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2\sqrt{-de}\,d^{2}}-\frac{b\,e^{2}n\,\mathrm{dilog}\left(\frac{ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2\sqrt{-de}\,d^{2}}+\frac{b\,e^{2}n\ln(x)\ln\left(\frac{-ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2\sqrt{-de}\,d^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^4/(e*x^2+d),x)
```

```
[Out] 1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/
2)*e*x)+a*e^2/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+b/d^2*e/x*ln(x^n)+b
/d^2*e/x*ln(c)+1/2*b*n*e^2/d^2/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-
d*e)^(1/2))-1/2*b*n*e^2/d^2/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)
^(1/2))+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^2/(d*e)^(1/2)*arctan(1
/(d*e)^(1/2)*e*x)-1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^2/(d*e)^(1/2)*arctan(1/(
d*e)^(1/2)*e*x)+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/x^3-1/3*b*
ln(x^n)/d/x^3+1/6*I*b*Pi*csgn(I*c*x^n)^3/d/x^3+b*e^2/d^2/(d*e)^(1/2)*arctan
(1/(d*e)^(1/2)*e*x)*ln(x^n)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
e^2/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)^2*e/d^2/x-1/3*b/d/x^3*ln(c)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/
d^2/x-b*e^2/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*n*ln(x)+1/2*b*n*e^2/d
^2/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*e^2/d^2/(-d
*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+a/d^2*e/x-1/3*a/d/x^3+b*ln
(c)*e^2/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/2*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*e/d^2/x-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/x^3-
1/9*b/d*n/x^3-1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x^3-1/2*I*b*Pi*csgn(I*
c*x^n)^3*e/d^2/x+b/d^2*e*n/x
```

maxima [F]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\,a\left(\frac{3\,e^{2}\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d^{2}}+\frac{3\,ex^{2}-d}{d^{2}x^{3}}\right)+b\int\frac{\log(c)+\log\left(x^{n}\right)}{ex^{6}+dx^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/3*a*(3*e^2*arctan(e*x/sqrt(d*e))/(sqrt(d*e)*d^2) + (3*e*x^2 - d)/(d^2*x^3
)) + b*integrate((log(c) + log(x^n))/(e*x^6 + d*x^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b \ln(c\,x^n)}{x^4 \left(e\,x^2 + d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \log(cx^n)}{x^4 \left(d + ex^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x**2+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**4*(d + e*x**2)), x)
```

3.221 $\int \frac{x^5\left(a+b\log(cx^n)\right)}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=129

$$-\frac{d\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}-\frac{bdn\text{Li}_2\left(-\frac{ex^2}{d}\right)}{2e^3}-\frac{bdn\log\left(d+e\right.}{4e^3}$$

```
[Out] -1/4*b*n*x^2/e^2+1/2*x^2*(a+b*ln(c*x^n))/e^2+1/2*d*x^2*(a+b*ln(c*x^n))/e^2/
(e*x^2+d)-1/4*b*d*n*ln(e*x^2+d)/e^3-d*(a+b*ln(c*x^n))*ln(1+e*x^2/d)/e^3-1/2
*b*d*n*polylog(2,-e*x^2/d)/e^3
```

Rubi [A] time = 0.22, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {266, 43, 2351, 2304, 2335, 260, 2337, 2391}

$$-\frac{bdn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{2e^3}+\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}-\frac{d\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}-\frac{bdn\log}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] -(b*n*x^2)/(4*e^2) + (x^2*(a + b*Log[c*x^n]))/(2*e^2) + (d*x^2*(a + b*Log[c
*x^n]))/(2*e^2*(d + e*x^2)) - (b*d*n*Log[d + e*x^2])/(4*e^3) - (d*(a + b*Lo
g[c*x^n])*Log[1 + (e*x^2)/d])/e^3 - (b*d*n*PolyLog[2, -((e*x^2)/d)])/(2*e^3
)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
```

```
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^5\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}\,dx = \int\left(\frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{d^2x\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)^2}-\frac{2dx\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int x\left(a+b\log\left(cx^n\right)\right)\,dx}{e^2}-\frac{(2d)\int\frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx}{e^2}+\frac{d^2\int\frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}\,dx}{e^2}$$

$$=-\frac{bnx^2}{4e^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}-\frac{d\left(a+b\log\left(cx^n\right)\right)\log\left(1+\right.}{e^3}$$

$$=-\frac{bnx^2}{4e^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}-\frac{bdn\log\left(d+ex^2\right)}{4e^3}-\frac{d\left(a+b\right.}{}$$

Mathematica [C] time = 0.51, size = 287, normalized size = 2.22

$$-\frac{2d^2\left(a+b\log\left(cx^n\right)-bn\log(x)\right)}{d+ex^2}-4d\log\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)-bn\log(x)\right)+2ex^2\left(a+b\log\left(cx^n\right)-bn\log(x)\right)+bn$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (2*e*x^2*(a - b*n*Log[x] + b*Log[c*x^n]) - (2*d^2*(a - b*n*Log[x] + b*Log[c
*x^n]))/(d + e*x^2) - 4*d*(a - b*n*Log[x] + b*Log[c*x^n])*Log[d + e*x^2] +
b*n*((d*Sqrt[e]*x*Log[x])/((-I)*Sqrt[d] + Sqrt[e]*x) + (d*Sqrt[e]*x*Log[x])
/(I*Sqrt[d] + Sqrt[e]*x) + e*x^2*(-1 + 2*Log[x]) - d*Log[I*Sqrt[d] - Sqrt[e
]*x] - d*Log[I*Sqrt[d] + Sqrt[e]*x] - 4*d*(Log[x]*Log[1 + (I*Sqrt[e]*x)/Sqr
t[d]] + PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]]) - 4*d*(Log[x]*Log[1 - (I*Sqrt
[e]*x)/Sqrt[d]] + PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])))/(4*e^3)
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^5\log\left(cx^n\right)+ax^5}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b*x^5*log(c*x^n) + a*x^5)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^5}{\left(ex^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x^2 + d)^2, x)
```

maple [C] time = 0.22, size = 687, normalized size = 5.33

$$\frac{bdn\ln(x)}{2e^3}-\frac{b\,d^2\ln(c)}{2\left(e\,x^2+d\right)e^3}-\frac{bd\ln(c)\ln\left(e\,x^2+d\right)}{e^3}+\frac{i\pi bd\text{csgn}\left(ic\,x^n\right)^3\ln\left(e\,x^2+d\right)}{2e^3}-\frac{i\pi b\,x^2\text{csgn}\left(ic\right)\text{csgn}\left(ix^n\right)\text{cs}}{4e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(b*ln(c*x^n)+a)/(e*x^2+d)^2,x)
```

```
[Out] 1/2*b*n/e^3*d*ln(x)-b*n*d/e^3*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-b*n*d
/e^3*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*ln(c)*d^2/e^3/(e*x^2+d)-b
*ln(c)/e^3*d*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3/e^2*x^2-1/4*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2*d^2/e^3/(e*x^2+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)^2/e^3*d*ln(e*x^2+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^3*d*ln(e*x^2
+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^3/(e*x^2+d)-1/4*I*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*x^2-b*ln(x^n)*d/e^3*ln(e*x^2+d)-1/2*b*ln
(x^n)*d^2/e^3/(e*x^2+d)-b*n*d/e^3*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2)
)-b*n*d/e^3*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+b*n*d/e^3*ln(x)*ln(e*
x^2+d)+1/2*b*ln(x^n)/e^2*x^2-1/2*a*d^2/e^3/(e*x^2+d)-a*d/e^3*ln(e*x^2+d)+1/
2*b/e^2*x^2*ln(c)+1/2*a/e^2*x^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*d^2/e^3/(e*x^2+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^3*d*
ln(e*x^2+d)-1/4*b/e^2*n*x^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*x^2+
1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*x^2+1/4*I*b*Pi*csgn(I*c*x^n)^3*d^2
/e^3/(e*x^2+d)+1/2*I*b*Pi*csgn(I*c*x^n)^3/e^3*d*ln(e*x^2+d)-1/4*b*d*n*ln(e*
x^2+d)/e^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a\left(\frac{d^2}{e^4x^2+de^3}-\frac{x^2}{e^2}+\frac{2\,d\log\left(ex^2+d\right)}{e^3}\right)+b\int \frac{x^5\log(c)+x^5\log\left(x^n\right)}{e^2x^4+2\,dex^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
[Out] -1/2*a*(d^2/(e^4*x^2 + d*e^3) - x^2/e^2 + 2*d*log(e*x^2 + d)/e^3) + b*integ
rate((x^5*log(c) + x^5*log(x^n))/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^5\,(a+b\,\ln(c\,x^n))}{\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2)^2,x)
```

```
[Out] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2)^2, x)
```

sympy [A] time = 112.34, size = 294, normalized size = 2.28

$$\frac{ad^2\left(\begin{cases}\frac{x^2}{d^2} & \text{for } e=0\\ -\frac{1}{de+e^2x^2} & \text{otherwise}\end{cases}\right)}{2e^2}-\frac{ad\left(\begin{cases}\frac{x^2}{d} & \text{for } e=0\\ \frac{\log\left(d+ex^2\right)}{e} & \text{otherwise}\end{cases}\right)}{e^2}+\frac{ax^2}{2e^2}-\frac{bd^2n\left(\begin{cases}\frac{x^2}{2d^2} & \text{for } e=0\\ -\frac{\log(x)}{de}+\frac{\log\left(\frac{d}{e}+x^2\right)}{2de} & \text{otherwise}\end{cases}\right)}{2e^2}+ \cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] a*d**2*Piecewise((x**2/d**2, Eq(e, 0)), (-1/(d*e + e**2*x**2), True))/(2*e*
*2) - a*d*Piecewise((x**2/d, Eq(e, 0)), (log(d + e*x**2)/e, True))/e**2 + a
*x**2/(2*e**2) - b*d**2*n*Piecewise((x**2/(2*d**2), Eq(e, 0)), (-log(x)/(d*
e) + log(d/e + x**2)/(2*d*e), True))/(2*e**2) + b*d**2*Piecewise((x**2/d**2
, Eq(e, 0)), (-1/(d*e + e**2*x**2), True))*log(c*x**n)/(2*e**2) + b*d*n*Pie
cewise((x**2/(2*d), Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x**
2*exp_polar(I*pi)/d)/2, Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x**2*
exp_polar(I*pi)/d)/2, 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()),
x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*
*2*exp_polar(I*pi)/d)/2, True))/e, True))/e**2 - b*d*Piecewise((x**2/d, Eq(
e, 0)), (log(d + e*x**2)/e, True))*log(c*x**n)/e**2 - b*n*x**2/(4*e**2) + b
*x**2*log(c*x**n)/(2*e**2)
```

3.222 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=95

$$\frac{\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2e^2}-\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e\left(d+ex^2\right)}+\frac{bn\text{Li}_2\left(-\frac{ex^2}{d}\right)}{4e^2}+\frac{bn\log\left(d+ex^2\right)}{4e^2}$$

```
[Out] -1/2*x^2*(a+b*ln(c*x^n))/e/(e*x^2+d)+1/4*b*n*ln(e*x^2+d)/e^2+1/2*(a+b*ln(c*
x^n))*ln(1+e*x^2/d)/e^2+1/4*b*n*polylog(2,-e*x^2/d)/e^2
```

Rubi [A] time = 0.19, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {266, 43, 2351, 2335, 260, 2337, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^2}+\frac{\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2e^2}-\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e\left(d+ex^2\right)}+\frac{bn\log\left(d+ex^2\right)}{4e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] -(x^2*(a + b*Log[c*x^n]))/(2*e*(d + e*x^2)) + (b*n*Log[d + e*x^2])/(4*e^2)
+ ((a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*e^2) + (b*n*PolyLog[2, -((e*x^
2)/d)])/(4*e^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
```

```
EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3 \left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}\,dx = \int \left(-\frac{dx\left(a+b\log\left(cx^n\right)\right)}{e\left(d+ex^2\right)^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{e\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx}{e} - \frac{d\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}\,dx}{e}$$

$$= -\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e\left(d+ex^2\right)} + \frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex^2}{d}\right)}{2e^2} - \frac{(bn)\int \frac{\log\left(1+\frac{ex^2}{d}\right)}{x}\,dx}{2e^2} + \frac{(bn)\ldots}{}$$

$$= -\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e\left(d+ex^2\right)} + \frac{bn\log\left(d+ex^2\right)}{4e^2} + \frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex^2}{d}\right)}{2e^2} + \frac{bn\mathrm{Li}_2\left(\ldots\right.}{4e^2\ldots}$$

Mathematica [C] time = 0.24, size = 321, normalized size = 3.38

$$\frac{2\log\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)-bn\log(x)\right)+\frac{2d\left(a+b\log\left(cx^n\right)-bn\log(x)\right)}{d+ex^2}+\frac{bn\left(2\left(d+ex^2\right)\mathrm{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)+2\left(d+ex^2\right)\mathrm{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)+ex^2\log(\ldots\right.}{\ldots}}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] ((2*d*(a - b*n*Log[x] + b*Log[c*x^n]))/(d + e*x^2) + 2*(a - b*n*Log[x] + b*
Log[c*x^n])*Log[d + e*x^2] + (b*n*(-2*e*x^2*Log[x] + d*Log[I*Sqrt[d] - Sqrt
[e]*x] + e*x^2*Log[I*Sqrt[d] - Sqrt[e]*x] + d*Log[I*Sqrt[d] + Sqrt[e]*x] +
e*x^2*Log[I*Sqrt[d] + Sqrt[e]*x] + 2*d*Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]
] + 2*e*x^2*Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 2*d*Log[x]*Log[1 + (I*S
qrt[e]*x)/Sqrt[d]] + 2*e*x^2*Log[x]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + 2*(d +
 e*x^2)*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 2*(d + e*x^2)*PolyLog[2, (I*
Sqrt[e]*x)/Sqrt[d]]))/(d + e*x^2))/(4*e^2)
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x^n) + a*x^3)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\log(cx^n)+a)x^3}{(ex^2+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^2 + d)^2, x)
```

maple [C] time = 0.19, size = 511, normalized size = 5.38

$$-\frac{i\pi bd\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)}{4\left(e\,x^2+d\right)e^2}+\frac{i\pi bd\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2}{4\left(e\,x^2+d\right)e^2}+\frac{i\pi bd\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)^2}{4\left(e\,x^2+d\right)e^2}-\frac{i\pi bd\mathrm{csgn}}{4\left(e\,x^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(e*x^2+d)^2,x)
```

```
[Out] 1/2*b*ln(x^n)*d/e^2/(e*x^2+d)+1/2*b*ln(x^n)/e^2*ln(e*x^2+d)-1/2*b*n/e^2*ln(
x)*ln(e*x^2+d)+1/2*b*n/e^2*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b
*n/e^2*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n/e^2*dilog((-e*x+(-
d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n/e^2*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2)
)+1/4*b*n*ln(e*x^2+d)/e^2-1/2*b*n/e^2*ln(x)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn
(I*c)*d/e^2/(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3*d/e^2/(e*x^2+d)-1/4*I*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2/(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)^2*d/e^2/(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2
*ln(e*x^2+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*ln(e*x^2+d)-1/4*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x
^n)^3/e^2*ln(e*x^2+d)+1/2*b*ln(c)*d/e^2/(e*x^2+d)+1/2*b*ln(c)/e^2*ln(e*x^2+
d)+1/2*a*d/e^2/(e*x^2+d)+1/2*a/e^2*ln(e*x^2+d)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{d}{e^3x^2+de^2}+\frac{\log\left(ex^2+d\right)}{e^2}\right)+b\int\frac{x^3\log(c)+x^3\log(x^n)}{e^2x^4+2\,dex^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(d/(e^3*x^2 + d*e^2) + log(e*x^2 + d)/e^2) + b*integrate((x^3*log(c)
+ x^3*log(x^n))/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x^2)^2,x)
```

```
[Out] int((x^3*(a + b*log(c*x^n)))/(d + e*x^2)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.223 $\int \frac{x(a+b\log(cx^n))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=50

$$\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d\left(d+ex^2\right)}-\frac{bn\log\left(d+ex^2\right)}{4de}$$

```
[Out] 1/2*x^2*(a+b*ln(c*x^n))/d/(e*x^2+d)-1/4*b*n*ln(e*x^2+d)/d/e
```

Rubi [A] time = 0.04, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2335, 260}

$$\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d\left(d+ex^2\right)}-\frac{bn\log\left(d+ex^2\right)}{4de}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (x^2*(a + b*Log[c*x^n]))/(2*d*(d + e*x^2)) - (b*n*Log[d + e*x^2])/(4*d*e)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}\,dx &= \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d\left(d+ex^2\right)}-\frac{(bn)\int \frac{x}{d+ex^2}\,dx}{2d}\\ &= \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d\left(d+ex^2\right)}-\frac{bn\log\left(d+ex^2\right)}{4de}\end{aligned}$$

Mathematica [A] time = 0.07, size = 74, normalized size = 1.48

$$-\frac{2ad+2bd\log\left(cx^n\right)+benx^2\log\left(d+ex^2\right)-2bn\log(x)\left(d+ex^2\right)+bdn\log\left(d+ex^2\right)}{4de\left(d+ex^2\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] -1/4*(2*a*d - 2*b*n*(d + e*x^2)*Log[x] + 2*b*d*Log[c*x^n] + b*d*n*Log[d + e
*x^2] + b*e*n*x^2*Log[d + e*x^2])/(d*e*(d + e*x^2))
```

fricas [A] time = 0.74, size = 61, normalized size = 1.22

$$\frac{2\,benx^2\log(x) - 2\,bd\log(c) - 2\,ad - \left(benx^2 + bdn\right)\log\left(ex^2 + d\right)}{4\left(de^2x^2 + d^2e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*e*n*x^2*log(x) - 2*b*d*log(c) - 2*a*d - (b*e*n*x^2 + b*d*n)*log(e*
x^2 + d))/(d*e^2*x^2 + d^2*e)
```

giac [A] time = 0.25, size = 70, normalized size = 1.40

$$-\frac{bnx^2e\log\left(x^2e + d\right) - 2\,bnx^2e\log(x) + bdn\log\left(x^2e + d\right) + 2\,bd\log(c) + 2\,ad}{4\left(dx^2e^2 + d^2e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] -1/4*(b*n*x^2*e*log(x^2*e + d) - 2*b*n*x^2*e*log(x) + b*d*n*log(x^2*e + d)
+ 2*b*d*log(c) + 2*a*d)/(d*x^2*e^2 + d^2*e)
```

maple [C] time = 0.20, size = 179, normalized size = 3.58

$$-\frac{b\ln(x^n)}{2\left(e\,x^2 + d\right)e} - \frac{-2ben\,x^2\ln(x) + ben\,x^2\ln\left(e\,x^2 + d\right) - i\pi bd\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n) + i\pi bd\,\mathrm{csgn}(ic)\,\mathrm{csg}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x^2+d)^2,x)
```

```
[Out] -1/2*b/e/(e*x^2+d)*ln(x^n)-1/4*(I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b
*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d*csgn(I*c*x^n)^3+I*Pi*b*d*cs
gn(I*c*x^n)^2*csgn(I*c)-2*ln(x)*b*e*n*x^2+ln(e*x^2+d)*b*e*n*x^2-2*ln(x)*b*d
*n+ln(e*x^2+d)*b*d*n+2*b*d*ln(c)+2*a*d)/(e*x^2+d)/e/d
```

maxima [A] time = 0.48, size = 71, normalized size = 1.42

$$-\frac{1}{4}\,bn\left(\frac{\log\left(ex^2 + d\right)}{de} - \frac{\log\left(x^2\right)}{de}\right) - \frac{b\log\left(cx^n\right)}{2\left(e^2x^2 + de\right)} - \frac{a}{2\left(e^2x^2 + de\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*b*n*(log(e*x^2 + d)/(d*e) - log(x^2)/(d*e)) - 1/2*b*log(c*x^n)/(e^2*x^
2 + d*e) - 1/2*a/(e^2*x^2 + d*e)
```

mupad [B] time = 3.50, size = 73, normalized size = 1.46

$$\frac{b\,n\,\ln(x)}{2\,d\,e} - \frac{b\,\ln\left(c\,x^n\right)}{2\,\left(e^2\,x^2 + d\,e\right)} - \frac{b\,n\,\ln\left(e\,x^2 + d\right)}{4\,d\,e} - \frac{a}{2\,e^2\,x^2 + 2\,d\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x^2)^2,x)
```

```
[Out] (b*n*log(x))/(2*d*e) - (b*log(c*x^n))/(2*(d*e + e^2*x^2)) - (b*n*log(d + e*
x^2))/(4*d*e) - a/(2*d*e + 2*e^2*x^2)
```

sympy [A] time = 59.95, size = 366, normalized size = 7.32

$$\begin{cases} \tilde{\infty}\left(-\frac{a}{2x^2} - \frac{bn\log(x)}{2x^2} - \frac{bn}{4x^2} - \frac{b\log(c)}{2x^2}\right) \\ \frac{-\frac{a}{2x^2} - \frac{bn\log(x)}{2x^2} - \frac{bn}{4x^2} - \frac{b\log(c)}{2x^2}}{e^2} \\ \frac{\frac{ax^2}{2} + \frac{bnx^2\log(x)}{2} - \frac{bnx^2}{4} + \frac{bx^2\log(c)}{2}}{d^2} \\ -\frac{2ad}{4d^2e+4de^2x^2} - \frac{bdn\log\left(-i\sqrt{d}\sqrt{\frac{1}{e}}+x\right)}{4d^2e+4de^2x^2} - \frac{bdn\log\left(i\sqrt{d}\sqrt{\frac{1}{e}}+x\right)}{4d^2e+4de^2x^2} + \frac{2benx^2\log(x)}{4d^2e+4de^2x^2} - \frac{benx^2\log\left(-i\sqrt{d}\sqrt{\frac{1}{e}}+x\right)}{4d^2e+4de^2x^2} - \frac{benx^2\log\left(i\sqrt{d}\sqrt{\frac{1}{e}}+x\right)}{4d^2e+4de^2x^2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Piecewise((zoo*(-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n/(4*x**2) - b*log(c)
/(2*x**2)), Eq(d, 0) & Eq(e, 0)), ((-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n
/(4*x**2) - b*log(c)/(2*x**2))/e**2, Eq(d, 0)), ((a*x**2/2 + b*n*x**2*log(x
)/2 - b*n*x**2/4 + b*x**2*log(c)/2)/d**2, Eq(e, 0)), (-2*a*d/(4*d**2*e + 4*
d*e**2*x**2) - b*d*n*log(-I*sqrt(d)*sqrt(1/e) + x)/(4*d**2*e + 4*d*e**2*x**
2) - b*d*n*log(I*sqrt(d)*sqrt(1/e) + x)/(4*d**2*e + 4*d*e**2*x**2) + 2*b*e*
n*x**2*log(x)/(4*d**2*e + 4*d*e**2*x**2) - b*e*n*x**2*log(-I*sqrt(d)*sqrt(1
/e) + x)/(4*d**2*e + 4*d*e**2*x**2) - b*e*n*x**2*log(I*sqrt(d)*sqrt(1/e) +
x)/(4*d**2*e + 4*d*e**2*x**2) + 2*b*e*x**2*log(c)/(4*d**2*e + 4*d*e**2*x**2
), True))
```

3.224 $\int \frac{a+b\log(cx^n)}{x(d+ex^2)^2}\,dx$

Optimal. Leaf size=82

$$-\frac{\log\left(\frac{d}{ex^2}+1\right)\left(2a+2b\log\left(cx^n\right)-bn\right)}{4d^2}+\frac{a+b\log\left(cx^n\right)}{2d\left(d+ex^2\right)}+\frac{bn\text{Li}_2\left(-\frac{d}{ex^2}\right)}{4d^2}$$

```
[Out] 1/2*(a+b*ln(c*x^n))/d/(e*x^2+d)-1/4*ln(1+d/e/x^2)*(2*a-b*n+2*b*ln(c*x^n))/d
^2+1/4*b*n*polylog(2,-d/e/x^2)/d^2
```

Rubi [A] time = 0.14, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2340, 2345, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{4d^2}-\frac{\log\left(\frac{d}{ex^2}+1\right)\left(2a+2b\log\left(cx^n\right)-bn\right)}{4d^2}+\frac{a+b\log\left(cx^n\right)}{2d\left(d+ex^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^2)^2),x]
```

```
[Out] (a + b*Log[c*x^n])/(2*d*(d + e*x^2)) - (Log[1 + d/(e*x^2)]*(2*a - b*n + 2*b
*Log[c*x^n]))/(4*d^2) + (b*n*PolyLog[2, -(d/(e*x^2))])/(4*d^2)
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log\left(cx^n\right)}{x\left(d+ex^2\right)^2}\,dx &= \frac{a+b\log\left(cx^n\right)}{2d\left(d+ex^2\right)}-\frac{\int \frac{-2a+bn-2b\log\left(cx^n\right)}{x\left(d+ex^2\right)}\,dx}{2d}\\
&= \frac{a+b\log\left(cx^n\right)}{2d\left(d+ex^2\right)}-\frac{\log\left(1+\frac{d}{ex^2}\right)\left(2a-bn+2b\log\left(cx^n\right)\right)}{4d^2}+\frac{(bn)\int \frac{\log\left(1+\frac{d}{ex^2}\right)}{x}\,dx}{2d^2}\\
&= \frac{a+b\log\left(cx^n\right)}{2d\left(d+ex^2\right)}-\frac{\log\left(1+\frac{d}{ex^2}\right)\left(2a-bn+2b\log\left(cx^n\right)\right)}{4d^2}+\frac{bn\text{Li}_2\left(-\frac{d}{ex^2}\right)}{4d^2}
\end{aligned}$$

Mathematica [C] time = 0.42, size = 279, normalized size = 3.40

$$-\frac{\log\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)-bn\log(x)\right)}{2d^2}+\frac{a+b\log\left(cx^n\right)-bn\log(x)}{2d^2+2dex^2}+\frac{\log(x)\left(a+b\log\left(cx^n\right)-bn\log(x)\right)}{d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^2)^2),x]
```

```
[Out] (a - b*n*Log[x] + b*Log[c*x^n])/(2*d^2 + 2*d*e*x^2) + (Log[x]*(a - b*n*Log[
x] + b*Log[c*x^n]))/d^2 - ((a - b*n*Log[x] + b*Log[c*x^n])*Log[d + e*x^2])/
(2*d^2) + (b*n*((Sqrt[e]*x*Log[x])/(I*Sqrt[d] - Sqrt[e]*x) - (Sqrt[e]*x*Log
[x])/(I*Sqrt[d] + Sqrt[e]*x) + 2*Log[x]^2 + Log[I*Sqrt[d] - Sqrt[e]*x] + Lo
g[I*Sqrt[d] + Sqrt[e]*x] - 2*(Log[x]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + PolyL
og[2, ((-I)*Sqrt[e]*x)/Sqrt[d]]) - 2*(Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]]
 + PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])))/(4*d^2)
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^2x^5+2\,dex^3+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^5 + 2*d*e*x^3 + d^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^2*x), x)
```

maple [C] time = 0.20, size = 644, normalized size = 7.85

$$\frac{bn\ln(x)\ln\left(e\,x^2+d\right)}{2d^2}-\frac{bn\ln(x)\ln\left(\frac{-ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2d^2}-\frac{bn\ln(x)\ln\left(\frac{ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2d^2}+\frac{b\ln(x)\ln\left(x^n\right)}{d^2}-\frac{bn\ln(x)^2}{2d^2}-\frac{bn\ln(x)}{2d^2}+\frac{}{2(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^2+d)^2,x)
```

```
[Out] 1/2*b*n/d^2*ln(x)*ln(e*x^2+d)-1/2*b*n/d^2*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*
e)^(1/2))-1/2*b*n/d^2*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*I*b*Pi*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*ln(x)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)/d/(e*x^2+d)+b*ln(x^n)/d^2*ln(x)-1/2*b/d^2*n*ln(x)^2-1/2*b
/d^2*n*ln(x)+1/2*b*ln(c)/d/(e*x^2+d)-1/2*b*ln(c)/d^2*ln(e*x^2+d)+1/2*a/d/(e
*x^2+d)-1/2*a/d^2*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3/d/(e*x^2+d)-1/2*I*
b*Pi*csgn(I*c*x^n)^3/d^2*ln(x)+1/4*I*b*Pi*csgn(I*c*x^n)^3/d^2*ln(e*x^2+d)+1
/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*ln(e*x^2+d)+1/2*b*ln(x^n)
/d/(e*x^2+d)-1/2*b*ln(x^n)/d^2*ln(e*x^2+d)+b/d^2*ln(c)*ln(x)+1/4*b*n/d^2*ln
(e*x^2+d)-1/2*b*n/d^2*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n/d^2*d
ilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+a/d^2*ln(x)-1/4*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)^2/d^2*ln(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/(e*x
```

```
^2+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*
x^n)^2*csgn(I*c)/d^2*ln(e*x^2+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*l
n(x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*ln(x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{1}{dex^2+d^2}-\frac{\log\left(ex^2+d\right)}{d^2}+\frac{2\,\log(x)}{d^2}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{e^2x^5+2\,dex^3+d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(1/(d*e*x^2 + d^2) - log(e*x^2 + d)/d^2 + 2*log(x)/d^2) + b*integrate
((log(c) + log(x^n))/(e^2*x^5 + 2*d*e*x^3 + d^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^n\right)}{x\,{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^2)^2),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^2)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.225 $\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=126

$$\frac{e\log\left(\frac{d}{ex^2}+1\right)\left(4a+4b\log\left(cx^n\right)-bn\right)}{4d^3}-\frac{4a+4b\log\left(cx^n\right)-bn}{4d^2x^2}+\frac{a+b\log\left(cx^n\right)}{2dx^2\left(d+ex^2\right)}-\frac{benLi_2\left(-\frac{d}{ex^2}\right)}{2d^3}-\frac{bn}{2d^2x^2}$$

```
[Out] -1/2*b*n/d^2/x^2+1/2*(a+b*ln(c*x^n))/d/x^2/(e*x^2+d)+1/4*(-4*a+b*n-4*b*ln(c
*x^n))/d^2/x^2+1/4*e*ln(1+d/e/x^2)*(4*a-b*n+4*b*ln(c*x^n))/d^3-1/2*b*e*n*po
lylog(2,-d/e/x^2)/d^3
```

Rubi [A] time = 0.29, antiderivative size = 159, normalized size of antiderivative = 1.26, number of steps used = 7, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2340, 266, 44, 2351, 2304, 2301, 2337, 2391}

$$\frac{benPolyLog\left(2,-\frac{ex^2}{d}\right)}{2d^3}-\frac{e\left(4a+4b\log\left(cx^n\right)-bn\right)^2}{16bd^3n}+\frac{e\log\left(\frac{ex^2}{d}+1\right)\left(4a+4b\log\left(cx^n\right)-bn\right)}{4d^3}-\frac{4a+4b\log\left(cx^n\right.}{4d^2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^2),x]
```

```
[Out] -(b*n)/(2*d^2*x^2) + (a + b*Log[c*x^n])/(2*d*x^2*(d + e*x^2)) - (4*a - b*n
+ 4*b*Log[c*x^n])/(4*d^2*x^2) - (e*(4*a - b*n + 4*b*Log[c*x^n])^2)/(16*b*d^
3*n) + (e*(4*a - b*n + 4*b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(4*d^3) + (b*e*n
*PolyLog[2, -((e*x^2)/d)])/(2*d^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
```

```
EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)^2}\,dx = \frac{a+b\log(cx^n)}{2dx^2\left(d+ex^2\right)} - \frac{\int \frac{-4a+bn-4b\log(cx^n)}{x^3\left(d+ex^2\right)}\,dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx^2\left(d+ex^2\right)} - \frac{\int \left(\frac{-4a+bn-4b\log(cx^n)}{dx^3} - \frac{e\left(-4a+bn-4b\log(cx^n)\right)}{d^2x} + \frac{e^2x\left(-4a+bn-4b\log(cx^n)\right)}{d^2\left(d+ex^2\right)}\right)dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx^2\left(d+ex^2\right)} - \frac{\int \frac{-4a+bn-4b\log(cx^n)}{x^3}\,dx}{2d^2} + \frac{e\int \frac{-4a+bn-4b\log(cx^n)}{x}\,dx}{2d^3} - \frac{e^2\int \frac{x\left(-4a+bn-4b\log(cx^n\right.}{d+ex^2}}{2d^3}$$

$$= -\frac{bn}{2d^2x^2} + \frac{a+b\log(cx^n)}{2dx^2\left(d+ex^2\right)} - \frac{4a-bn+4b\log(cx^n)}{4d^2x^2} - \frac{e\left(4a-bn+4b\log(cx^n)\right)^2}{16bd^3n} + \frac{e\left(4a\right.}{}$$

$$= -\frac{bn}{2d^2x^2} + \frac{a+b\log(cx^n)}{2dx^2\left(d+ex^2\right)} - \frac{4a-bn+4b\log(cx^n)}{4d^2x^2} - \frac{e\left(4a-bn+4b\log(cx^n)\right)^2}{16bd^3n} + \frac{e\left(4a\right.}{}$$

Mathematica [C] time = 0.57, size = 334, normalized size = 2.65

$$\frac{4e\log\left(d+ex^2\right)\left(a+b\log(cx^n)-bn\log(x)\right) - \frac{2de\left(a+b\log(cx^n)-bn\log(x)\right)}{d+ex^2} - \frac{2d\left(a+b\log(cx^n)-bn\log(x)\right)}{x^2} - 8e\log(x)\left(a+b\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^2),x]
```

```
[Out] ((-2*d*(a - b*n*Log[x] + b*Log[c*x^n]))/x^2 - (2*d*e*(a - b*n*Log[x] + b*Lo
g[c*x^n]))/(d + e*x^2) - 8*e*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n]) + 4*e*(
a - b*n*Log[x] + b*Log[c*x^n])*Log[d + e*x^2] + b*n*((e^(3/2)*x*Log[x])/((-
```

```
I)*Sqrt[d] + Sqrt[e]*x) - 4*e*Log[x]^2 - (d + 2*d*Log[x])/x^2 - e*Log[I*Sqr
t[d] - Sqrt[e]*x] + ((-I)*e^(3/2)*x*Log[x] + e*(-Sqrt[d] + I*Sqrt[e]*x)*Log
[I*Sqrt[d] + Sqrt[e]*x])/(Sqrt[d] - I*Sqrt[e]*x) + 4*e*(Log[x]*Log[1 + (I*S
qrt[e]*x)/Sqrt[d]] + PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]]) + 4*e*(Log[x]*Lo
g[1 - (I*Sqrt[e]*x)/Sqrt[d]] + PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])))/(4*d^3)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{2}x^{7}+2\,dex^{5}+d^{2}x^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^7 + 2*d*e*x^5 + d^2*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex^{2}+d\right)^{2}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^2*x^3), x)
```

maple [C] time = 0.20, size = 817, normalized size = 6.48

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(e*x^2+d)^2,x)
```

```
[Out] -2*b/d^3*e*ln(c)*ln(x)+b/d^3*e*n*ln(x)^2+1/2*b/d^3*e*n*ln(x)+1/2*I*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2/d^3*e*ln(e*x^2+d)-I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
/d^3*e*ln(x)-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*e*ln(x)+1/4*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/x^2+1/4*I*b*Pi*csgn(I*c*x^n)^3/d^2/x^2-
1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2/(e*x^2+d)+1/2*I*b*Pi*csgn(I*c*
x^n)^2*csgn(I*c)/d^3*e*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d
^2/(e*x^2+d)-1/2*b*ln(x^n)/d^2/x^2+I*b*Pi*csgn(I*c*x^n)^3/d^3*e*ln(x)-1/2*a
/d^2/x^2-b*n/d^3*e*ln(x)*ln(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)*e/d^2/(e*x^2+d)-1/2*a*e/d^2/(e*x^2+d)+a*e/d^3*ln(e*x^2+d)-2*a/d^3*
e*ln(x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e*ln(e*x^2+d)-1/
2*b/d^2/x^2*ln(c)+b*n/d^3*e*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+b*n/
d^3*e*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)/d^3*e*ln(x)+1/4*I*b*Pi*csgn(I*c*x^n)^3*e/d^2/(e*x^2+d)-1/2*
I*b*Pi*csgn(I*c*x^n)^3/d^3*e*ln(e*x^2+d)+b*ln(c)/d^3*e*ln(e*x^2+d)-1/2*b*ln
(c)*e/d^2/(e*x^2+d)+b*n/d^3*e*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+b*n/d
^3*e*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*n/d^3*e*ln(e*x^2+d)-1/4*I
*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/x^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n
)^2/d^2/x^2-1/4*b/d^2*n/x^2+b*ln(x^n)*e/d^3*ln(e*x^2+d)-1/2*b*ln(x^n)*e/d^2
/(e*x^2+d)-2*b*ln(x^n)/d^3*e*ln(x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a\left(\frac{2\,ex^{2}+d}{d^{2}ex^{4}+d^{3}x^{2}}-\frac{2\,e\log\left(ex^{2}+d\right)}{d^{3}}+\frac{4\,e\log(x)}{d^{3}}\right)+b\int \frac{\log(c)+\log\left(x^{n}\right)}{e^{2}x^{7}+2\,dex^{5}+d^{2}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*((2*e*x^2 + d)/(d^2*e*x^4 + d^3*x^2) - 2*e*log(e*x^2 + d)/d^3 + 4*e*
log(x)/d^3) + b*integrate((log(c) + log(x^n))/(e^2*x^7 + 2*d*e*x^5 + d^2*x^
3), x)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)^2),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)^2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.226 $\int \frac{x^4(a+b\log(cx^n))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=191

$$-\frac{3\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{5/2}}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}+\frac{ax}{e^2}+\frac{bx\log\left(cx^n\right)}{e^2}+\frac{3ib\sqrt{d}\,n\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4e^{5/2}}-\frac{3ib\sqrt{d}\,n\text{L}\cdots}{4e^{5\cdots}}$$

```
[Out] a*x/e^2-b*n*x/e^2+b*x*ln(c*x^n)/e^2+1/2*d*x*(a+b*ln(c*x^n))/e^2/(e*x^2+d)-1
/2*b*n*arctan(x*e^(1/2)/d^(1/2))*d^(1/2)/e^(5/2)-3/2*arctan(x*e^(1/2)/d^(1/
2))*(a+b*ln(c*x^n))*d^(1/2)/e^(5/2)+3/4*I*b*n*polylog(2,-I*x*e^(1/2)/d^(1/2
))*d^(1/2)/e^(5/2)-3/4*I*b*n*polylog(2,I*x*e^(1/2)/d^(1/2))*d^(1/2)/e^(5/2)
```

Rubi [A] time = 0.30, antiderivative size = 191, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {288, 321, 205, 2351, 2295, 2323, 2324, 12, 4848, 2391}

$$\frac{3ib\sqrt{d}\,n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4e^{5/2}}-\frac{3ib\sqrt{d}\,n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4e^{5/2}}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}-\frac{3\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(c\cdots\right.\right.}{2e^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (a*x)/e^2 - (b*n*x)/e^2 - (b*Sqrt[d]*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*e^(5
/2)) + (b*x*Log[c*x^n])/e^2 + (d*x*(a + b*Log[c*x^n]))/(2*e^2*(d + e*x^2))
- (3*Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*e^(5/2)) +
(((3*I)/4)*b*Sqrt[d]*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/e^(5/2) - (((3
*I)/4)*b*Sqrt[d]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/e^(5/2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{x^4 \left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}dx = \int \left(\frac{a+b\log\left(cx^n\right)}{e^2} + \frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)^2} - \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \left(a+b\log\left(cx^n\right)\right)dx}{e^2} - \frac{(2d)\int \frac{a+b\log(cx^n)}{d+ex^2}dx}{e^2} + \frac{d^2\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^2}dx}{e^2}$$

$$= \frac{ax}{e^2} + \frac{dx\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)} - \frac{2\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{5/2}} + \frac{b\int \log\left(cx^n\right)dx}{e^2}$$

$$= \frac{ax}{e^2} - \frac{bnx}{e^2} - \frac{b\sqrt{d}\,n\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}} + \frac{bx\log\left(cx^n\right)}{e^2} + \frac{dx\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)} - \frac{3\sqrt{d}\tan}{}$$

$$= \frac{ax}{e^2} - \frac{bnx}{e^2} - \frac{b\sqrt{d}\,n\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}} + \frac{bx\log\left(cx^n\right)}{e^2} + \frac{dx\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)} - \frac{3\sqrt{d}\tan}{}$$

$$= \frac{ax}{e^2} - \frac{bnx}{e^2} - \frac{b\sqrt{d}\,n\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}} + \frac{bx\log\left(cx^n\right)}{e^2} + \frac{dx\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)} - \frac{3\sqrt{d}\tan}{}$$

$$= \frac{ax}{e^2} - \frac{bnx}{e^2} - \frac{b\sqrt{d}\,n\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}} + \frac{bx\log\left(cx^n\right)}{e^2} + \frac{dx\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)} - \frac{3\sqrt{d}\tan}{}$$

Mathematica [A] time = 0.56, size = 296, normalized size = 1.55

$$\frac{-\frac{d\left(a+b\log(cx^n)\right)}{\sqrt{-d}-\sqrt{e}x} + \frac{d\left(a+b\log(cx^n)\right)}{\sqrt{-d}+\sqrt{e}x} - 3\sqrt{-d}\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)\left(a+b\log\left(cx^n\right)\right) + 3\sqrt{-d}\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\left(a+b\log(cx^n\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (4*a*Sqrt[e]*x - 4*b*Sqrt[e]*n*x + 4*b*Sqrt[e]*x*Log[c*x^n] - (d*(a + b*Log
[c*x^n]))/(Sqrt[-d] - Sqrt[e]*x) + (d*(a + b*Log[c*x^n]))/(Sqrt[-d] + Sqrt[
e]*x) + (b*d*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/Sqrt[-d] + b*Sqrt[-d]*
n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]) - 3*Sqrt[-d]*(a + b*Log[c*x^n])*Log[
1 + (Sqrt[e]*x)/Sqrt[-d]] + 3*Sqrt[-d]*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e
]*x)/(-d)^(3/2)] + 3*b*Sqrt[-d]*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]] - 3*b*Sq
rt[-d]*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(4*e^(5/2))
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^4\log\left(cx^n\right)+ax^4}{e^2x^4+2\,dex^2+d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^4*log(c*x^n) + a*x^4)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^4}{\left(ex^2+d\right)^2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^4/(e*x^2 + d)^2, x)
```

maple [C] time = 0.30, size = 913, normalized size = 4.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(b*ln(c*x^n)+a)/(e*x^2+d)^2,x)
```

```
[Out] 1/2*b*ln(c)/e^2*d*x/(e*x^2+d)-3/2*b*ln(c)/e^2*d/(d*e)^(1/2)*arctan(1/(d*e)^
(1/2)*e*x)-3/4*b*n/e^2*d/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2
))+3/4*b*n/e^2*d/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*
n/e^2*d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+1/2*b/e^2*d*x/(e*x^2+d)*ln(x^
n)-3/2*b/e^2*d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*ln(x^n)-1/2*I*b*Pi*csg
n(I*c*x^n)^3/e^2*x+1/4*b*n*d^2/e^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-
d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*n*d^2/e^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((
e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*d/
(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+b*ln(x^n)/e^2*x-3/4*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)^2/e^2*d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/4*I*b*Pi*cs
gn(I*c*x^n)^3/e^2*d*x/(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*
d*x/(e*x^2+d)-1/4*b*n*d/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2)
)/(-d*e)^(1/2))*x^2+1/4*b*n*d/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e
)^(1/2))/(-d*e)^(1/2))*x^2+b/e^2*x*ln(c)+3/4*I*b*Pi*csgn(I*c*x^n)^3/e^2*d/(
d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)/e^2*d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/4*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)/e^2*d*x/(e*x^2+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(
I*c)/e^2*d*x/(e*x^2+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*x
-b*n/e^2*d/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+b*n/e^2*
d/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-b/e^2*n*x+a/e^2*x+
1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*x+1/2*I*b*Pi*csgn(I*c*x^n)^2*csg
n(I*c)/e^2*x+1/2*a/e^2*d*x/(e*x^2+d)-3/2*a/e^2*d/(d*e)^(1/2)*arctan(1/(d*e)
^(1/2)*e*x)+3/2*b/e^2*d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*n*ln(x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{dx}{e^3x^2+de^2}-\frac{3\,d\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,e^2}+\frac{2\,x}{e^2}\right)+b\int\frac{x^4\log(c)+x^4\log\left(x^n\right)}{e^2x^4+2\,dex^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(d*x/(e^3*x^2 + d*e^2) - 3*d*arctan(e*x/sqrt(d*e))/(sqrt(d*e)*e^2) +
2*x/e^2) + b*integrate((x^4*log(c) + x^4*log(x^n))/(e^2*x^4 + 2*d*e*x^2 + d
^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^4\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*log(c*x^n)))/(d + e*x^2)^2,x)
```

```
[Out] int((x^4*(a + b*log(c*x^n)))/(d + e*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4 \left(a + b \log \left(c x^n\right)\right)}{\left(d + e x^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Integral(x**4*(a + b*log(c*x**n))/(d + e*x**2)**2, x)
```

3.227 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex^2)^2} dx$

Optimal. Leaf size=164

$$\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}e^{3/2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{2e\left(d+ex^2\right)}-\frac{ibn\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{d}e^{3/2}}+\frac{ibn\text{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{d}e^{3/2}}+\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{3/2}}$$

```
[Out] -1/2*x*(a+b*ln(c*x^n))/e/(e*x^2+d)+1/2*b*n*arctan(x*e^(1/2)/d^(1/2))/e^(3/2
)/d^(1/2)+1/2*arctan(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/e^(3/2)/d^(1/2)-1/4
*I*b*n*polylog(2,-I*x*e^(1/2)/d^(1/2))/e^(3/2)/d^(1/2)+1/4*I*b*n*polylog(2,
I*x*e^(1/2)/d^(1/2))/e^(3/2)/d^(1/2)
```

Rubi [A] time = 0.27, antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {288, 205, 2351, 2323, 2324, 12, 4848, 2391}

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{d}e^{3/2}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{d}e^{3/2}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}e^{3/2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{2e\left(d+ex^2\right)}+\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*Sqrt[d]*e^(3/2)) - (x*(a + b*Log[c*x^n
]))/(2*e*(d + e*x^2)) + (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2
*Sqrt[d]*e^(3/2)) - ((I/4)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[
d]*e^(3/2)) + ((I/4)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*e^(3/2
))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}\,dx=\int\left(-\frac{d\left(a+b\log\left(cx^n\right)\right)}{e\left(d+ex^2\right)^2}+\frac{a+b\log\left(cx^n\right)}{e\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int\frac{a+b\log(cx^n)}{d+ex^2}\,dx}{e}-\frac{d\int\frac{a+b\log(cx^n)}{\left(d+ex^2\right)^2}\,dx}{e}$$

$$=-\frac{x\left(a+b\log\left(cx^n\right)\right)}{2e\left(d+ex^2\right)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\,e^{3/2}}-\frac{\int\frac{a+b\log(cx^n)}{d+ex^2}\,dx}{2e}+\frac{(bn)\int \ldots}{2\ldots}$$

$$=\frac{bn\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{2e\left(d+ex^2\right)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}\,e^{3/2}}-\frac{(bn)\int\frac{\tan\ldots}{\ldots}}{\sqrt{d}\ldots}$$

$$=\frac{bn\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{2e\left(d+ex^2\right)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}\,e^{3/2}}-\frac{(ibn)\int\frac{\log\ldots}{\ldots}}{2\sqrt{\ldots}}$$

$$=\frac{bn\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{2e\left(d+ex^2\right)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}\,e^{3/2}}-\frac{ibn\text{Li}_2\left(-\ldots\right)}{2\sqrt{d}\,e\ldots}$$

$$=\frac{bn\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{2e\left(d+ex^2\right)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}\,e^{3/2}}-\frac{ibn\text{Li}_2\left(-\ldots\right)}{4\sqrt{d}\,e\ldots}$$

Mathematica [A] time = 0.49, size = 258, normalized size = 1.57

$$\frac{\frac{d\log\left(\frac{\sqrt{e}\,x}{\sqrt{-d}}+1\right)\left(a+b\log(cx^n)\right)}{(-d)^{3/2}}+\frac{\log\left(\frac{d\sqrt{e}\,x}{(-d)^{3/2}}+1\right)\left(a+b\log(cx^n)\right)}{\sqrt{-d}}+\frac{a+b\log(cx^n)}{\sqrt{-d}-\sqrt{e}\,x}-\frac{a+b\log(cx^n)}{\sqrt{-d}+\sqrt{e}\,x}+\frac{bn\text{Li}_2\left(\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)}{\sqrt{-d}}+\frac{bdn\text{Li}_2\left(\frac{d\sqrt{e}\,x}{(-d)^{3/2}}\right)}{(-d)^{3/2}}+\frac{bdn(\text{lo}\ldots}{\ldots}}{4e^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] ((a + b*Log[c*x^n])/(Sqrt[-d] - Sqrt[e]*x) - (a + b*Log[c*x^n])/(Sqrt[-d] +
 Sqrt[e]*x) + (b*d*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/(-d)^(3/2) + (b*
n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/Sqrt[-d] + (d*(a + b*Log[c*x^n])*Lo
g[1 + (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(3/2) + ((a + b*Log[c*x^n])*Log[1 + (d*Sq
rt[e]*x)/(-d)^(3/2)])/Sqrt[-d] + (b*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/Sqr
t[-d] + (b*d*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(3/2))/(4*e^(3/2)
)
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\log\left(cx^n\right)+ax^2}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x^2}{\left(ex^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^2 + d)^2, x)
```

maple [C] time = 0.34, size = 752, normalized size = 4.59

$$-\frac{bn\,x^2\ln(x)\ln\left(\frac{-ex+\sqrt{-de}}{\sqrt{-de}}\right)}{4\left(e\,x^2+d\right)\sqrt{-de}}+\frac{bn\,x^2\ln(x)\ln\left(\frac{ex+\sqrt{-de}}{\sqrt{-de}}\right)}{4\left(e\,x^2+d\right)\sqrt{-de}}-\frac{bdn\ln(x)\ln\left(\frac{-ex+\sqrt{-de}}{\sqrt{-de}}\right)}{4\left(e\,x^2+d\right)\sqrt{-de}\,e}+\frac{bdn\ln(x)\ln\left(\frac{ex+\sqrt{-de}}{\sqrt{-de}}\right)}{4\left(e\,x^2+d\right)\sqrt{-de}\,e}+\frac{i\pi bx\,\mathrm{csg}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(e*x^2+d)^2,x)
```

```
[Out] -1/2*b/e*x/(e*x^2+d)*ln(x^n)-1/2*b/e/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*
n*ln(x)+1/2*b/e/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*ln(x^n)+1/2*b*n/e/(-d
*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n/e/(-d*e)^(1/2)
*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*b*n/e/(-d*e)^(1/2)*dilog((-e
*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*n/e/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/
2))/(-d*e)^(1/2))+1/2*b*n/e/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/4*b*n*l
n(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+1/4*b*
n*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2-1/4*
b*n*d/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1
/4*b*n*d/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))
+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*
x)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e/(d*e)^(1/2)*arctan(1/(d
*e)^(1/2)*e*x)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x/(e*x^2+d)+1/4*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)^2/e/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+1/4*I
*b*Pi*csgn(I*c*x^n)^3/e*x/(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/
e*x/(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3/e/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)
*e*x)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e*x/(e*x^2+d)-1/2*b*ln
```

```
(c)/e*x/(e*x^2+d)+1/2*b*ln(c)/e/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/2*a
/e*x/(e*x^2+d)+1/2*a/e/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}a\left(\frac{x}{e^2x^2+de}-\frac{\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,e}\right)+b\int\frac{x^2\log(c)+x^2\log\left(x^n\right)}{e^2x^4+2\,dex^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(x/(e^2*x^2 + d*e) - arctan(e*x/sqrt(d*e))/(sqrt(d*e)*e)) + b*integr
ate((x^2*log(c) + x^2*log(x^n))/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2)^2,x)
```

```
[Out] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))/(d + e*x**2)**2, x)
```

3.228 $\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=164

$$\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^{3/2}\sqrt{e}}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{2d\left(d+ex^2\right)}-\frac{ibn\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{3/2}\sqrt{e}}+\frac{ibn\text{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{3/2}\sqrt{e}}-\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}}$$

```
[Out] 1/2*x*(a+b*ln(c*x^n))/d/(e*x^2+d)-1/2*b*n*arctan(x*e^(1/2)/d^(1/2))/d^(3/2)
/e^(1/2)+1/2*arctan(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/d^(3/2)/e^(1/2)-1/4*
I*b*n*polylog(2,-I*x*e^(1/2)/d^(1/2))/d^(3/2)/e^(1/2)+1/4*I*b*n*polylog(2,I
*x*e^(1/2)/d^(1/2))/d^(3/2)/e^(1/2)
```

Rubi [A] time = 0.10, antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {2323, 205, 2324, 12, 4848, 2391}

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{3/2}\sqrt{e}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{3/2}\sqrt{e}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^{3/2}\sqrt{e}}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{2d\left(d+ex^2\right)}-\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^2)^2,x]
```

```
[Out] -(b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*d^(3/2)*Sqrt[e]) + (x*(a + b*Log[c*x^
n]))/(2*d*(d + e*x^2)) + (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(
2*d^(3/2)*Sqrt[e]) - ((I/4)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/(d^(3
/2)*Sqrt[e]) + ((I/4)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/(d^(3/2)*Sqrt[
e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex^2)^2}\,dx = \frac{x(a+b\log(cx^n))}{2d(d+ex^2)} + \frac{\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{2d} - \frac{(bn)\int \frac{1}{d+ex^2}\,dx}{2d}$$

$$= -\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{2d(d+ex^2)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}\sqrt{e}} - \frac{(bn)\int \frac{\tan^{-1}(}{\sqrt{d}\,\sqrt{}}}{2d}$$

$$= -\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{2d(d+ex^2)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}\sqrt{e}} - \frac{(bn)\int \frac{\tan^{-1}(}{x}}{2d^{3/2}\sqrt{}}$$

$$= -\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{2d(d+ex^2)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}\sqrt{e}} - \frac{(ibn)\int \frac{\log(1-}{}}{4d^{3/2}\sqrt{}}$$

$$= -\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{2d(d+ex^2)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}\sqrt{e}} - \frac{ibn\mathrm{Li}_2\left(-\frac{i\sqrt{e}}{\sqrt{d}}\right.}{4d^{3/2}\sqrt{e}}$$

Mathematica [A] time = 0.58, size = 289, normalized size = 1.76

$$\frac{1}{4}\left(\frac{\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n))}{(-d)^{3/2}\sqrt{e}} + \frac{d\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)(a+b\log(cx^n))}{(-d)^{5/2}\sqrt{e}} + \frac{a+b\log(cx^n)}{d\left(\sqrt{-d}\sqrt{e}+ex\right)} + \frac{a+b\log(cx^n}{dex+(-d)^{3/2}\sqrt{}}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^2)^2,x]
```

```
[Out] ((a + b*Log[c*x^n])/(d*(Sqrt[-d]*Sqrt[e] + e*x)) + (a + b*Log[c*x^n])/((-d)
^(3/2)*Sqrt[e] + d*e*x) + (b*d*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/((-d
)^(5/2)*Sqrt[e]) + (b*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/((-d)^(3/2)*S
qrt[e]) + ((a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/((-d)^(3/2)*Sq
rt[e]) + (d*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/((-d)^(5/
2)*Sqrt[e]) + (b*d*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/((-d)^(5/2)*Sqrt[e])
 + (b*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/((-d)^(3/2)*Sqrt[e]))/4
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\log(cx^n)+a}{e^2x^4+2dex^2+d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{(ex^2+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^2 + d)^2, x)
```

maple [C] time = 0.34, size = 685, normalized size = 4.18

$$\frac{ben\,x^2\ln(x)\ln\left(\frac{-ex+\sqrt{-de}}{\sqrt{-de}}\right)}{4\left(e\,x^2+d\right)\sqrt{-de}\;d}-\frac{ben\,x^2\ln(x)\ln\left(\frac{ex+\sqrt{-de}}{\sqrt{-de}}\right)}{4\left(e\,x^2+d\right)\sqrt{-de}\;d}-\frac{i\pi bx\operatorname{csgn}(ic)\operatorname{csgn}(ix^n)\operatorname{csgn}(ic\,x^n)}{4\left(e\,x^2+d\right)d}+\frac{i\pi bx\operatorname{csgn}(ic)\operatorname{csgn}}{4\left(e\,x^2+d\right)c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x^2+d)^2,x)
```

```
[Out] 1/2*b*x/d/(e*x^2+d)*ln(x^n)-1/2*b/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*n
*ln(x)+1/2*b/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*ln(x^n)-1/2*b*n/d/(d*e
)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+1/4*b*n*ln(x)/d/(e*x^2+d)/(-d*e)^(1/2)*ln
((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2*e-1/4*b*n*ln(x)/d/(e*x^2+d)/(-d*e)^(
1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2*e+1/4*b*n*ln(x)/(e*x^2+d)/(-d*
e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*n*ln(x)/(e*x^2+d)/(-d*e
)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*b*n/d/(-d*e)^(1/2)*dilog((-
e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*n/d/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1
/2))/(-d*e)^(1/2))+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*x/d/(e*x^2+d)-1/4*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2
)*e*x)-1/4*I*b*Pi*csgn(I*c*x^n)^3*x/d/(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3/
d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)^2/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)^2*x/d/(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x/d/
(e*x^2+d)+1/2*b*ln(c)*x/d/(e*x^2+d)+1/2*b*ln(c)/d/(d*e)^(1/2)*arctan(1/(d*e
)^(1/2)*e*x)+1/2*a*x/d/(e*x^2+d)+1/2*a/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e
*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{x}{dex^2+d^2}+\frac{\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{e^2x^4+2\,dex^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(x/(d*e*x^2 + d^2) + arctan(e*x/sqrt(d*e))/(sqrt(d*e)*d)) + b*integra
te((log(c) + log(x^n))/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^n\right)}{\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x^2)^2,x)
```

```
[Out] int((a + b*log(c*x^n))/(d + e*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a+b\log\left(cx^n\right)}{\left(d+ex^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))/(d + e*x**2)**2, x)
```

3.229 $\int \frac{a+b\log(cx^n)}{x^2\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=183

$$-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(3a+3b\log\left(cx^n\right)-bn\right)}{2d^{5/2}}-\frac{3a+3b\log\left(cx^n\right)-bn}{2d^2x}+\frac{a+b\log\left(cx^n\right)}{2dx\left(d+ex^2\right)}+\frac{3ib\sqrt{e}\,n\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{5/2}}-\frac{3ib\sqrt{e}$$

```
[Out] -3/2*b*n/d^2/x+1/2*(a+b*ln(c*x^n))/d/x/(e*x^2+d)+1/2*(-3*a+b*n-3*b*ln(c*x^n
))/d^2/x-1/2*arctan(x*e^(1/2)/d^(1/2))*(3*a-b*n+3*b*ln(c*x^n))*e^(1/2)/d^(5
/2)+3/4*I*b*n*polylog(2,-I*x*e^(1/2)/d^(1/2))*e^(1/2)/d^(5/2)-3/4*I*b*n*pol
ylog(2,I*x*e^(1/2)/d^(1/2))*e^(1/2)/d^(5/2)
```

Rubi [A] time = 0.28, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2340, 325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$\frac{3ib\sqrt{e}\,n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{5/2}}-\frac{3ib\sqrt{e}\,n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{5/2}}-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(3a+3b\log\left(cx^n\right)-bn\right)}{2d^{5/2}}-\frac{3a+3b\log(}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^2),x]
```

```
[Out] (-3*b*n)/(2*d^2*x) + (a + b*Log[c*x^n])/(2*d*x*(d + e*x^2)) - (3*a - b*n +
3*b*Log[c*x^n])/(2*d^2*x) - (Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(3*a - b*n
 + 3*b*Log[c*x^n]))/(2*d^(5/2)) + (((3*I)/4)*b*Sqrt[e]*n*PolyLog[2, ((-I)*S
qrt[e]*x)/Sqrt[d]])/d^(5/2) - (((3*I)/4)*b*Sqrt[e]*n*PolyLog[2, (I*Sqrt[e]*
x)/Sqrt[d]])/d^(5/2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
```

```
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2\left(d+ex^2\right)^2}\,dx = \frac{a+b\log(cx^n)}{2dx\left(d+ex^2\right)} - \frac{\int \frac{-3a+bn-3b\log(cx^n)}{x^2\left(d+ex^2\right)}\,dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx\left(d+ex^2\right)} - \frac{\int \left(\frac{-3a+bn-3b\log(cx^n)}{dx^2} - \frac{e\left(-3a+bn-3b\log(cx^n)\right)}{d\left(d+ex^2\right)}\right)dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx\left(d+ex^2\right)} - \frac{\int \frac{-3a+bn-3b\log(cx^n)}{x^2}\,dx}{2d^2} + \frac{e\int \frac{-3a+bn-3b\log(cx^n)}{d+ex^2}\,dx}{2d^2}$$

$$= -\frac{3bn}{2d^2x} + \frac{a+b\log(cx^n)}{2dx\left(d+ex^2\right)} - \frac{3a-bn+3b\log(cx^n)}{2d^2x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(3a-bn+3b\log\right.}{2d^{5/2}}$$

$$= -\frac{3bn}{2d^2x} + \frac{a+b\log(cx^n)}{2dx\left(d+ex^2\right)} - \frac{3a-bn+3b\log(cx^n)}{2d^2x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(3a-bn+3b\log\right.}{2d^{5/2}}$$

$$= -\frac{3bn}{2d^2x} + \frac{a+b\log(cx^n)}{2dx\left(d+ex^2\right)} - \frac{3a-bn+3b\log(cx^n)}{2d^2x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(3a-bn+3b\log\right.}{2d^{5/2}}$$

$$= -\frac{3bn}{2d^2x} + \frac{a+b\log(cx^n)}{2dx\left(d+ex^2\right)} - \frac{3a-bn+3b\log(cx^n)}{2d^2x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(3a-bn+3b\log\right.}{2d^{5/2}}$$

Mathematica [A] time = 0.73, size = 328, normalized size = 1.79

$$\frac{1}{4}\left(\frac{\sqrt{e}\left(a+b\log\left(cx^n\right)\right)}{d^2\left(\sqrt{-d}-\sqrt{e}x\right)}-\frac{\sqrt{e}\left(a+b\log\left(cx^n\right)\right)}{d^2\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{4\left(a+b\log\left(cx^n\right)\right)}{d^2x}+\frac{3\sqrt{e}\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)\left(a+b\log\left(cx^n\right)\right)}{(-d)^{5/2}}-\frac{3\sqrt{}}{\ }\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^2),x]
```

```
[Out] ((-4*b*n)/(d^2*x) - (4*(a + b*Log[c*x^n]))/(d^2*x) + (Sqrt[e]*(a + b*Log[c*
x^n]))/(d^2*(Sqrt[-d] - Sqrt[e]*x)) - (Sqrt[e]*(a + b*Log[c*x^n]))/(d^2*(Sq
rt[-d] + Sqrt[e]*x)) + (b*Sqrt[e]*n*(-Log[x] + Log[Sqrt[-d] - Sqrt[e]*x]))/
(-d)^(5/2) + (b*Sqrt[e]*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/(-d)^(5/2)
+ (3*Sqrt[e]*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(5/2) -
 (3*Sqrt[e]*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(5/2
) - (3*b*Sqrt[e]*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(5/2) + (3*b*Sqrt
[e]*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(5/2))/4
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^2x^6+2\,dex^4+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^6 + 2*d*e*x^4 + d^2*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^2*x^2), x)
```

maple [C] time = 0.37, size = 933, normalized size = 5.10

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(e*x^2+d)^2,x)
```

```
[Out] -1/4*b*n*e/d*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/
2))+1/4*b*n*e/d*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(
1/2))+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^2/x-3/2*b*e/d^2/(d*e)^(1/2)*arctan(1/(d*
e)^(1/2)*e*x)*ln(x^n)-1/2*b*e/d^2*x/(e*x^2+d)*ln(x^n)-3/4*b*n*e/d^2/(-d*e)^
(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/4*b*n*e/d^2/(-d*e)^(1/2)*di
log((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*e/d^2/(d*e)^(1/2)*arctan(1/(d*
e)^(1/2)*e*x)-1/2*b*ln(c)*e/d^2*x/(e*x^2+d)-3/2*b*ln(c)*e/d^2/(d*e)^(1/2)*a
rctan(1/(d*e)^(1/2)*e*x)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2*x/(e*
x^2+d)-b*ln(x^n)/d^2/x-b/d^2/x*ln(c)-a/d^2/x-3/4*I*b*Pi*csgn(I*c*x^n)^2*csg
n(I*c)*e/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/4*I*b*Pi*csgn(I*c*x^n)
^2*csgn(I*c)*e/d^2*x/(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*e/d^2*x/(e*x^2+d)+3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/(
```

```
d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2
*e/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)/d^2/x-1/4*b*n*e^2/d^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*
x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+1/4*b*n*e^2/d^2*ln(x)/(e*x^2+d)/(-d*e)^(1
/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+3/4*I*b*Pi*csgn(I*c*x^n)^3*e/d^
2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/2*a*e/d^2*x/(e*x^2+d)-3/2*a*e/d^2
/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-b/d^2*n/x+1/4*I*b*Pi*csgn(I*c*x^n)^3
*e/d^2*x/(e*x^2+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/x-1/2*I*b*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)^2/d^2/x+3/2*b*e/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2
)*e*x)*n*ln(x)-1/2*b*n*e/d^2/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*
e)^(1/2))+1/2*b*n*e/d^2/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/
2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a\left(\frac{3\,ex^{2}+2\,d}{d^{2}ex^{3}+d^{3}x}+\frac{3\,e\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d^{2}}\right)+b\int\frac{\log(c)+\log\left(x^{n}\right)}{e^{2}x^{6}+2\,dex^{4}+d^{2}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*((3*e*x^2 + 2*d)/(d^2*e*x^3 + d^3*x) + 3*e*arctan(e*x/sqrt(d*e))/(sq
rt(d*e)*d^2)) + b*integrate((log(c) + log(x^n))/(e^2*x^6 + 2*d*e*x^4 + d^2*
x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^{n}\right)}{x^{2}\,{\left(e\,x^{2}+d\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)^2),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a+b\log\left(cx^{n}\right)}{x^{2}\left(d+ex^{2}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**2*(d + e*x**2)**2), x)
```

3.230 $\int \frac{a+b\log(cx^n)}{x^4\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=224

$$\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(5a+5b\log\left(cx^n\right)-bn\right)}{2d^{7/2}}+\frac{e\left(5a+5b\log\left(cx^n\right)-bn\right)}{2d^3x}-\frac{5a+5b\log\left(cx^n\right)-bn}{6d^2x^3}+\frac{a+b\log\left(cx^n\right)}{2dx^3\left(d+ex^2\right)}-\cdots$$

```
[Out] -5/18*b*n/d^2/x^3+5/2*b*e*n/d^3/x+1/2*(a+b*ln(c*x^n))/d/x^3/(e*x^2+d)+1/6*(
-5*a+b*n-5*b*ln(c*x^n))/d^2/x^3+1/2*e*(5*a-b*n+5*b*ln(c*x^n))/d^3/x+1/2*e^(
3/2)*arctan(x*e^(1/2)/d^(1/2))*(5*a-b*n+5*b*ln(c*x^n))/d^(7/2)-5/4*I*b*e^(3
/2)*n*polylog(2,-I*x*e^(1/2)/d^(1/2))/d^(7/2)+5/4*I*b*e^(3/2)*n*polylog(2,I
*x*e^(1/2)/d^(1/2))/d^(7/2)
```

Rubi [A] time = 0.31, antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2340, 325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$-\frac{5ibe^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{7/2}}+\frac{5ibe^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{7/2}}+\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(5a+5b\log\left(cx^n\right)-bn\right)}{2d^{7/2}}+\frac{e\left(5a+5b\cdots\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^2),x]
```

```
[Out] (-5*b*n)/(18*d^2*x^3) + (5*b*e*n)/(2*d^3*x) + (a + b*Log[c*x^n])/(2*d*x^3*(
d + e*x^2)) - (5*a - b*n + 5*b*Log[c*x^n])/(6*d^2*x^3) + (e*(5*a - b*n + 5*
b*Log[c*x^n]))/(2*d^3*x) + (e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(5*a - b*n
+ 5*b*Log[c*x^n]))/(2*d^(7/2)) - (((5*I)/4)*b*e^(3/2)*n*PolyLog[2, ((-I)*Sq
rt[e]*x)/Sqrt[d]])/d^(7/2) + (((5*I)/4)*b*e^(3/2)*n*PolyLog[2, (I*Sqrt[e]*x
)/Sqrt[d]])/d^(7/2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)^2}\,dx = \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{\int \frac{-5a+bn-5b\log(cx^n)}{x^4(d+ex^2)}\,dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{\int \left(\frac{-5a+bn-5b\log(cx^n)}{dx^4} - \frac{e(-5a+bn-5b\log(cx^n))}{d^2x^2} + \frac{e^2(-5a+bn-5b\log(cx^n))}{d^2(d+ex^2)}\right)dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{\int \frac{-5a+bn-5b\log(cx^n)}{x^4}\,dx}{2d^2} + \frac{e\int \frac{-5a+bn-5b\log(cx^n)}{x^2}\,dx}{2d^3} - \frac{e^2\int \frac{-5a+bn-5b\log(cx^n)}{d+ex^2}\,}{2d^3}$$

$$= -\frac{5bn}{18d^2x^3} + \frac{5ben}{2d^3x} + \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{5a-bn+5b\log(cx^n)}{6d^2x^3} + \frac{e(5a-bn+5b\log(cx^n))}{2d^3x}$$

$$= -\frac{5bn}{18d^2x^3} + \frac{5ben}{2d^3x} + \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{5a-bn+5b\log(cx^n)}{6d^2x^3} + \frac{e(5a-bn+5b\log(cx^n))}{2d^3x}$$

$$= -\frac{5bn}{18d^2x^3} + \frac{5ben}{2d^3x} + \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{5a-bn+5b\log(cx^n)}{6d^2x^3} + \frac{e(5a-bn+5b\log(cx^n))}{2d^3x}$$

$$= -\frac{5bn}{18d^2x^3} + \frac{5ben}{2d^3x} + \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{5a-bn+5b\log(cx^n)}{6d^2x^3} + \frac{e(5a-bn+5b\log(cx^n))}{2d^3x}$$

Mathematica [A] time = 0.71, size = 361, normalized size = 1.61

$$\frac{1}{36}\left(-\frac{9e^{3/2}(a+b\log(cx^n))}{d^3(\sqrt{-d}-\sqrt{e}x)} + \frac{9e^{3/2}(a+b\log(cx^n))}{d^3(\sqrt{-d}+\sqrt{e}x)} + \frac{72e(a+b\log(cx^n))}{d^3x} - \frac{12(a+b\log(cx^n))}{d^2x^3} + \frac{45e^{3/2}\log(}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^2),x]
```

```
[Out] ((-4*b*n)/(d^2*x^3) + (72*b*e*n)/(d^3*x) - (12*(a + b*Log[c*x^n]))/(d^2*x^3
) + (72*e*(a + b*Log[c*x^n]))/(d^3*x) - (9*e^(3/2)*(a + b*Log[c*x^n]))/(d^3
*(Sqrt[-d] - Sqrt[e]*x)) + (9*e^(3/2)*(a + b*Log[c*x^n]))/(d^3*(Sqrt[-d] +
Sqrt[e]*x)) - (9*b*e^(3/2)*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/(-d)^(7/
2) + (9*b*e^(3/2)*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/(-d)^(7/2) + (45*
e^(3/2)*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(7/2) - (45*
e^(3/2)*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(7/2) -
(45*b*e^(3/2)*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(7/2) + (45*b*e^(3/2
)*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(7/2))/36
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{e^2x^8+2\,dex^6+d^2x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^8 + 2*d*e*x^6 + d^2*x^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b \log(cx^n) + a}{(ex^2 + d)^2 x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^2*x^4), x)
```

maple [C] time = 0.34, size = 1133, normalized size = 5.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^4/(e*x^2+d)^2,x)
```

```
[Out] -5/4*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+2
*b/d^3*e/x*ln(c)+5/2*b*ln(c)*e^2/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+
1/2*b*ln(c)*e^2/d^3*x/(e*x^2+d)+5/4*b*n*e^2/d^3/(-d*e)^(1/2)*dilog((-e*x+(-
d*e)^(1/2))/(-d*e)^(1/2))-5/4*b*n*e^2/d^3/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1
/2))/(-d*e)^(1/2))-1/2*b*n*e^2/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/
4*b*n*e^3/d^3*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/
2))*x^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3*x/(e*x^2+d)+
1/4*b*n*e^3/d^3*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^
(1/2))*x^2+1/4*b*n*e^2/d^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/
2))/(-d*e)^(1/2))-1/4*b*n*e^2/d^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*
e)^(1/2))/(-d*e)^(1/2))-1/3*b*ln(c)/d^2/x^3-1/3*b/d^2/x^3*ln(x^n)+1/6*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/x^3-1/3*a/d^2/x^3+1/4*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3*x/(e*x^2+d)+5/4*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2*e^2/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)/d^3*e/x+2*a/d^3*e/x+1/2*b*e^2/d^3*x/(e*x^2+d)*ln(x^n)
+I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*e/x+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^
2/d^3*e/x-I*b*Pi*csgn(I*c*x^n)^3/d^3*e/x-5/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)*e^2/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+1/4*I*b*Pi*csgn(
I*c*x^n)^2*csgn(I*c)*e^2/d^3*x/(e*x^2+d)+5/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*
c)*e^2/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+5/2*b*e^2/d^3/(d*e)^(1/2)*
arctan(1/(d*e)^(1/2)*e*x)*ln(x^n)+1/6*I*b*Pi*csgn(I*c*x^n)^3/d^2/x^3-1/4*I*
b*Pi*csgn(I*c*x^n)^3*e^2/d^3*x/(e*x^2+d)-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)^2/d^2/x^3+2*b*ln(x^n)/d^3*e/x+1/2*a*e^2/d^3*x/(e*x^2+d)+5/2*a*e^2/d^3/(d
*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-5/2*b*e^2/d^3/(d*e)^(1/2)*arctan(1/(d*e
)^(1/2)*e*x)*n*ln(x)+b*n*e^2/d^3/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/
(-d*e)^(1/2))-b*n*e^2/d^3/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(
1/2))-1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/x^3-1/9*b*n/d^2/x^3+2*b/d^3*
e*n/x
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{6}\, a \left(\frac{15\, e^2 x^4 + 10\, d e x^2 - 2\, d^2}{d^3 e x^5 + d^4 x^3} + \frac{15\, e^2 \arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\, d^3}\right) + b \int \frac{\log(c) + \log(x^n)}{e^2 x^8 + 2\, d e x^6 + d^2 x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/6*a*((15*e^2*x^4 + 10*d*e*x^2 - 2*d^2)/(d^3*e*x^5 + d^4*x^3) + 15*e^2*arc
tan(e*x/sqrt(d*e))/(sqrt(d*e)*d^3)) + b*integrate((log(c) + log(x^n))/(e^2*
x^8 + 2*d*e*x^6 + d^2*x^4), x)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^4\,{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)^2),x)
[Out] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)^2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x**2+d)**2,x)
[Out] Timed out
```

3.231 $\int \frac{x^5(a+b\log(cx^n))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=152

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4e^3\left(d+ex^2\right)^2}+\frac{\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3}-\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)}+\frac{bn\text{Li}_2\left(-\frac{ex^2}{d}\right)}{4e^3}+\frac{bdn}{8e^3\left(d+ex^2\right)}+\frac{3bn}{}$$

```
[Out] 1/8*b*d*n/e^3/(e*x^2+d)+1/4*b*n*ln(x)/e^3-1/4*d^2*(a+b*ln(c*x^n))/e^3/(e*x^
2+d)^2-x^2*(a+b*ln(c*x^n))/e^2/(e*x^2+d)+3/8*b*n*ln(e*x^2+d)/e^3+1/2*(a+b*l
n(c*x^n))*ln(1+e*x^2/d)/e^3+1/4*b*n*polylog(2,-e*x^2/d)/e^3
```

Rubi [A] time = 0.29, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {266, 43, 2351, 2338, 44, 2335, 260, 2337, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4e^3\left(d+ex^2\right)^2}-\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)}+\frac{\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3}+\frac{bdn}{8e^3\left(d+ex^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] (b*d*n)/(8*e^3*(d + e*x^2)) + (b*n*Log[x])/(4*e^3) - (d^2*(a + b*Log[c*x^n]
))/(4*e^3*(d + e*x^2)^2) - (x^2*(a + b*Log[c*x^n]))/(e^2*(d + e*x^2)) + (3*
b*n*Log[d + e*x^2])/(8*e^3) + ((a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*e^
3) + (b*n*PolyLog[2, -((e*x^2)/d)])/(4*e^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
```

```
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^5\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^3}\,dx = \int \left(\frac{d^2x\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)^3} - \frac{2dx\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)^2} + \frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}dx}{e^2} - \frac{(2d)\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}dx}{e^2} + \frac{d^2\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^3}dx}{e^2}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4e^3\left(d+ex^2\right)^2} - \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)} + \frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex^2}{d}\right)}{2e^3} - \frac{(b}{}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4e^3\left(d+ex^2\right)^2} - \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)} + \frac{bn\log\left(d+ex^2\right)}{2e^3} + \frac{\left(a+b\log\left(cx^n\right)\right.}{2e}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4e^3\left(d+ex^2\right)^2} - \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)} + \frac{bn\log\left(d+ex^2\right)}{2e^3} + \frac{\left(a+b\log\left(cx^n\right)\right.}{2e}$$

$$= \frac{bdn}{8e^3\left(d+ex^2\right)} + \frac{bn\log(x)}{4e^3} - \frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4e^3\left(d+ex^2\right)^2} - \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)} + \frac{3bn\log}{8}$$

Mathematica [C] time = 0.60, size = 498, normalized size = 3.28

$$\frac{-2d^2\left(a+b\log\left(cx^n\right)-bn\log(x)\right)+8d\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)-bn\log(x)\right)+4\left(d+ex^2\right)^2\log\left(d+ex^2\right)\left(a\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] (-2*d^2*(a - b*n*Log[x] + b*Log[c*x^n]) + 8*d*(d + e*x^2)*(a - b*n*Log[x] +
 b*Log[c*x^n]) + 4*(d + e*x^2)^2*(a - b*n*Log[x] + b*Log[c*x^n])*Log[d + e*
x^2] + b*n*(d^2 + d*e*x^2 - 4*d*e*x^2*Log[x] - 6*e^2*x^4*Log[x] + 3*d^2*Log
[I*Sqrt[d] - Sqrt[e]*x] + 6*d*e*x^2*Log[I*Sqrt[d] - Sqrt[e]*x] + 3*e^2*x^4*
Log[I*Sqrt[d] - Sqrt[e]*x] + 3*d^2*Log[I*Sqrt[d] + Sqrt[e]*x] + 6*d*e*x^2*L
og[I*Sqrt[d] + Sqrt[e]*x] + 3*e^2*x^4*Log[I*Sqrt[d] + Sqrt[e]*x] + 4*d^2*Lo
g[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 8*d*e*x^2*Log[x]*Log[1 - (I*Sqrt[e]*x
)/Sqrt[d]] + 4*e^2*x^4*Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 4*d^2*Log[x]
*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + 8*d*e*x^2*Log[x]*Log[1 + (I*Sqrt[e]*x)/Sq
rt[d]] + 4*e^2*x^4*Log[x]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + 4*(d + e*x^2)^2*
PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 4*(d + e*x^2)^2*PolyLog[2, (I*Sqrt[e
]*x)/Sqrt[d]]))/(8*e^3*(d + e*x^2)^2)
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bx^5\log\left(cx^n\right)+ax^5}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^5*log(c*x^n) + a*x^5)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^5}{\left(ex^2+d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x^2 + d)^3, x)
```

maple [C] time = 0.21, size = 727, normalized size = 4.78

$$\frac{bn\,\mathrm{dilog}\left(\frac{-ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2e^3}+\frac{bn\,\mathrm{dilog}\left(\frac{ex+\sqrt{-de}}{\sqrt{-de}}\right)}{2e^3}-\frac{a\,d^2}{4\left(e\,x^2+d\right)^2e^3}+\frac{ad}{\left(e\,x^2+d\right)e^3}+\frac{b\ln(c)\ln\left(e\,x^2+d\right)}{2e^3}+\frac{a\ln\left(e\,x^2+d\right)}{2e^3}+\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(b*ln(c*x^n)+a)/(e*x^2+d)^3,x)
```

```
[Out] 1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^3/(e*x^2+d)-1/8*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)^2*d^2/e^3/(e*x^2+d)^2-1/4*I*b*Pi*csgn(I*c*x^n)^3/e^3*ln(e*
x^2+d)+1/2*b*n/e^3*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n/e^3*dilo
g((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*a*d^2/e^3/(e*x^2+d)^2+a*d/e^3/(e*x^2
+d)+1/2*b*ln(c)/e^3*ln(e*x^2+d)+1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*d^2/e^3/(e*x^2+d)^2+1/2*a/e^3*ln(e*x^2+d)+1/2*b*ln(x^n)/e^3*ln(e*x^2+d)
+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^3/(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)/e^3*ln(e*x^2+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)*d/e^3/(e*x^2+d)-1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^3/
(e*x^2+d)^2-1/2*b*n/e^3*ln(x)*ln(e*x^2+d)+1/2*b*n/e^3*ln(x)*ln((-e*x+(-d*e)
^(1/2))/(-d*e)^(1/2))+1/2*b*n/e^3*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))
-3/4*b*n*ln(x)/e^3+3/8*b*n*ln(e*x^2+d)/e^3+b*ln(x^n)*d/e^3/(e*x^2+d)-1/4*b*
ln(x^n)*d^2/e^3/(e*x^2+d)^2+1/8*I*b*Pi*csgn(I*c*x^n)^3*d^2/e^3/(e*x^2+d)^2-
1/2*I*b*Pi*csgn(I*c*x^n)^3*d/e^3/(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2/e^3*ln(e*x^2+d)-1/4*b*ln(c)*d^2/e^3/(e*x^2+d)^2+b*ln(c)*d/e^3/(e*x^2
+d)+1/8*b*d*n/e^3/(e*x^2+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^3*ln(e*x
^2+d)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{4}\,a\left(\frac{4\,dex^2+3\,d^2}{e^5x^4+2\,de^4x^2+d^2e^3}+\frac{2\,\log\left(ex^2+d\right)}{e^3}\right)+b\int\frac{x^5\log(c)+x^5\log\left(x^n\right)}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*((4*d*e*x^2 + 3*d^2)/(e^5*x^4 + 2*d*e^4*x^2 + d^2*e^3) + 2*log(e*x^2
+ d)/e^3) + b*integrate((x^5*log(c) + x^5*log(x^n))/(e^3*x^6 + 3*d*e^2*x^4
+ 3*d^2*e*x^2 + d^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^5\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\left(e\,x^2+d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2)^3,x)
```

```
[Out] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2)^3, x)
```

sympy [A] time = 163.09, size = 381, normalized size = 2.51

$$\frac{ad^2\left(\begin{cases}\frac{x^2}{d^3} & \text{for } e=0\\ -\frac{1}{2e\left(d+ex^2\right)^2} & \text{otherwise}\end{cases}\right)}{2e^2} - \frac{ad\left(\begin{cases}\frac{x^2}{d^2} & \text{for } e=0\\ -\frac{1}{de+e^2x^2} & \text{otherwise}\end{cases}\right)}{e^2} + \frac{a\left(\begin{cases}\frac{x^2}{d} & \text{for } e=0\\ \frac{\log\left(d+ex^2\right)}{e} & \text{otherwise}\end{cases}\right)}{2e^2} - \frac{bd^2n\left(\begin{cases}\frac{x^2}{2d^3} \\ -\frac{1}{4d^2e+4c}\end{cases}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] a*d**2*Piecewise((x**2/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x**2)**2), True))/(
2*e**2) - a*d*Piecewise((x**2/d**2, Eq(e, 0)), (-1/(d*e + e**2*x**2), True)
)/e**2 + a*Piecewise((x**2/d, Eq(e, 0)), (log(d + e*x**2)/e, True))/(2*e**2
) - b*d**2*n*Piecewise((x**2/(2*d**3), Eq(e, 0)), (-1/(4*d**2*e + 4*d*e**2*
x**2) - log(x)/(2*d**2*e) + log(d/e + x**2)/(4*d**2*e), True))/(2*e**2) + b
*d**2*Piecewise((x**2/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x**2)**2), True))*lo
g(c*x**n)/(2*e**2) + b*d*n*Piecewise((x**2/(2*d**2), Eq(e, 0)), (-log(x)/(d
*e) + log(d/e + x**2)/(2*d*e), True))/e**2 - b*d*Piecewise((x**2/d**2, Eq(e
, 0)), (-1/(d*e + e**2*x**2), True))*log(c*x**n)/e**2 - b*n*Piecewise((x**2
/(2*d), Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x**2*exp_polar(
I*pi)/d)/2, Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x**2*exp_polar(I*
pi)/d)/2, 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) +
meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x**2*exp_polar
(I*pi)/d)/2, True))/e, True))/(2*e**2) + b*Piecewise((x**2/d, Eq(e, 0)), (l
og(d + e*x**2)/e, True))*log(c*x**n)/(2*e**2)
```

3.232 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=68

$$\frac{x^4\left(a+b\log\left(cx^n\right)\right)}{4d\left(d+ex^2\right)^2}-\frac{bn}{8e^2\left(d+ex^2\right)}-\frac{bn\log\left(d+ex^2\right)}{8de^2}$$

```
[Out] -1/8*b*n/e^2/(e*x^2+d)+1/4*x^4*(a+b*ln(c*x^n))/d/(e*x^2+d)^2-1/8*b*n*ln(e*x
^2+d)/d/e^2
```

Rubi [A] time = 0.08, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2335, 266, 43}

$$\frac{x^4\left(a+b\log\left(cx^n\right)\right)}{4d\left(d+ex^2\right)^2}-\frac{bn}{8e^2\left(d+ex^2\right)}-\frac{bn\log\left(d+ex^2\right)}{8de^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] -(b*n)/(8*e^2*(d + e*x^2)) + (x^4*(a + b*Log[c*x^n]))/(4*d*(d + e*x^2)^2) -
 (b*n*Log[d + e*x^2])/(8*d*e^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^3}\,dx=\frac{x^4\left(a+b\log\left(cx^n\right)\right)}{4d\left(d+ex^2\right)^2}-\frac{(bn)\int\frac{x^3}{\left(d+ex^2\right)^2}\,dx}{4d}$$

$$=\frac{x^4\left(a+b\log\left(cx^n\right)\right)}{4d\left(d+ex^2\right)^2}-\frac{(bn)\,\text{Subst}\left(\int\frac{x}{(d+ex)^2}\,dx,x,x^2\right)}{8d}$$

$$=\frac{x^4\left(a+b\log\left(cx^n\right)\right)}{4d\left(d+ex^2\right)^2}-\frac{(bn)\,\text{Subst}\left(\int\left(-\frac{d}{e(d+ex)^2}+\frac{1}{e(d+ex)}\right)dx,x,x^2\right)}{8d}$$

$$=-\frac{bn}{8e^2\left(d+ex^2\right)}+\frac{x^4\left(a+b\log\left(cx^n\right)\right)}{4d\left(d+ex^2\right)^2}-\frac{bn\log\left(d+ex^2\right)}{8de^2}$$

Mathematica [A] time = 0.15, size = 129, normalized size = 1.90

$$-\frac{2ad^2+4adex^2+2bd\left(d+2ex^2\right)\log\left(cx^n\right)+bd^2n\log\left(d+ex^2\right)+bd^2n+be^2nx^4\log\left(d+ex^2\right)+bdenx^2+2b\cdots}{8de^2\left(d+ex^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] -1/8*(2*a*d^2 + b*d^2*n + 4*a*d*e*x^2 + b*d*e*n*x^2 - 2*b*n*(d + e*x^2)^2*L
og[x] + 2*b*d*(d + 2*e*x^2)*Log[c*x^n] + b*d^2*n*Log[d + e*x^2] + 2*b*d*e*n
*x^2*Log[d + e*x^2] + b*e^2*n*x^4*Log[d + e*x^2])/(d*e^2*(d + e*x^2)^2)
```

fricas [B] time = 0.76, size = 126, normalized size = 1.85

$$\frac{2\,be^2nx^4\log(x)-bd^2n-2\,ad^2-(bden+4\,ade)x^2-\left(be^2nx^4+2\,bdenx^2+bd^2n\right)\log\left(ex^2+d\right)-2\left(2\,bdex^2+b\cdots\right.}{8\left(de^4x^4+2\,d^2e^3x^2+d^3e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] 1/8*(2*b*e^2*n*x^4*log(x) - b*d^2*n - 2*a*d^2 - (b*d*e*n + 4*a*d*e)*x^2 - (
b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*log(e*x^2 + d) - 2*(2*b*d*e*x^2 + b*
d^2)*log(c))/(d*e^4*x^4 + 2*d^2*e^3*x^2 + d^3*e^2)
```

giac [B] time = 0.30, size = 140, normalized size = 2.06

$$-\frac{bnx^4e^2\log\left(x^2e+d\right)-2\,bnx^4e^2\log(x)+2\,bdnx^2e\log\left(x^2e+d\right)+bdnx^2e+4\,bdx^2e\log(c)+4\,adx^2e+bd^2n\,\cdots}{8\left(dx^4e^4+2\,d^2x^2e^3+d^3e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] -1/8*(b*n*x^4*e^2*log(x^2*e + d) - 2*b*n*x^4*e^2*log(x) + 2*b*d*n*x^2*e*log
(x^2*e + d) + b*d*n*x^2*e + 4*b*d*x^2*e*log(c) + 4*a*d*x^2*e + b*d^2*n*log(
x^2*e + d) + b*d^2*n + 2*b*d^2*log(c) + 2*a*d^2)/(d*x^4*e^4 + 2*d^2*x^2*e^3
 + d^3*e^2)
```

maple [C] time = 0.24, size = 369, normalized size = 5.43

$$-\frac{\left(2e\,x^{2}+d\right)b\ln\left(x^{n}\right)}{4\left(e\,x^{2}+d\right)^{2}e^{2}}-\frac{-2b\,e^{2}n\,x^{4}\ln(x)+b\,e^{2}n\,x^{4}\ln\left(e\,x^{2}+d\right)-2i\pi bde\,x^{2}\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)+2i\pi b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(e*x^2+d)^3,x)
```

```
[Out] -1/4*b*(2*e*x^2+d)/(e*x^2+d)^2/e^2*ln(x^n)-1/8*(-2*I*Pi*b*d*e*x^2*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d^2*
csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^3-2*ln(x)*b*e^2*
n*x^4+ln(e*x^2+d)*b*e^2*n*x^4+2*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)-I*
Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi*b*d*e*x^2*csgn(I*x^n)*c
sgn(I*c*x^n)^2-I*Pi*b*d^2*csgn(I*c*x^n)^3-4*ln(x)*b*d*e*n*x^2+2*ln(e*x^2+d)
*b*d*e*n*x^2+4*b*d*e*x^2*ln(c)+b*d*e*n*x^2-2*ln(x)*b*d^2*n+ln(e*x^2+d)*b*d^
2*n+4*a*d*e*x^2+2*b*d^2*ln(c)+b*d^2*n+2*a*d^2)/e^2/d/(e*x^2+d)^2
```

maxima [B] time = 0.51, size = 128, normalized size = 1.88

$$-\frac{1}{8}\,bn\left(\frac{1}{e^{3}x^{2}+de^{2}}+\frac{\log\left(ex^{2}+d\right)}{de^{2}}-\frac{\log\left(x^{2}\right)}{de^{2}}\right)-\frac{\left(2\,ex^{2}+d\right)b\log\left(cx^{n}\right)}{4\left(e^{4}x^{4}+2\,de^{3}x^{2}+d^{2}e^{2}\right)}-\frac{\left(2\,ex^{2}+d\right)a}{4\left(e^{4}x^{4}+2\,de^{3}x^{2}+d^{2}e^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/8*b*n*(1/(e^3*x^2 + d*e^2) + log(e*x^2 + d)/(d*e^2) - log(x^2)/(d*e^2))
 - 1/4*(2*e*x^2 + d)*b*log(c*x^n)/(e^4*x^4 + 2*d*e^3*x^2 + d^2*e^2) - 1/4*(2
*e*x^2 + d)*a/(e^4*x^4 + 2*d*e^3*x^2 + d^2*e^2)
```

mupad [B] time = 3.74, size = 129, normalized size = 1.90

$$\frac{b\,n\,\ln(x)}{4\,d\,e^{2}}-\frac{\ln\left(c\,x^{n}\right)\left(\frac{b\,x^{2}}{2\,e}+\frac{b\,d}{4\,e^{2}}\right)}{d^{2}+2\,d\,e\,x^{2}+e^{2}\,x^{4}}-\frac{b\,n\,\ln\left(e\,x^{2}+d\right)}{8\,d\,e^{2}}-\frac{\left(2\,a\,e+\frac{b\,e\,n}{2}\right)x^{2}+a\,d+\frac{b\,d\,n}{2}}{4\,d^{2}\,e^{2}+8\,d\,e^{3}\,x^{2}+4\,e^{4}\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x^2)^3,x)
```

```
[Out] (b*n*log(x))/(4*d*e^2) - (log(c*x^n)*((b*x^2)/(2*e) + (b*d)/(4*e^2)))/(d^2
+ e^2*x^4 + 2*d*e*x^2) - (b*n*log(d + e*x^2))/(8*d*e^2) - (a*d + x^2*(2*a*e
 + (b*e*n)/2) + (b*d*n)/2)/(4*d^2*e^2 + 4*e^4*x^4 + 8*d*e^3*x^2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.233 $\int \frac{x\left(a+b\log(cx^n)\right)}{\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=82

$$-\frac{a+b\log\left(cx^n\right)}{4e\left(d+ex^2\right)^2}-\frac{bn\log\left(d+ex^2\right)}{8d^2e}+\frac{bn\log(x)}{4d^2e}+\frac{bn}{8de\left(d+ex^2\right)}$$

```
[Out] 1/8*b*n/d/e/(e*x^2+d)+1/4*b*n*ln(x)/d^2/e+1/4*(-a-b*ln(c*x^n))/e/(e*x^2+d)^
2-1/8*b*n*ln(e*x^2+d)/d^2/e
```

Rubi [A] time = 0.07, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2338, 266, 44}

$$-\frac{a+b\log\left(cx^n\right)}{4e\left(d+ex^2\right)^2}-\frac{bn\log\left(d+ex^2\right)}{8d^2e}+\frac{bn\log(x)}{4d^2e}+\frac{bn}{8de\left(d+ex^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] (b*n)/(8*d*e*(d + e*x^2)) + (b*n*Log[x])/(4*d^2*e) - (a + b*Log[c*x^n])/(4*
e*(d + e*x^2)^2) - (b*n*Log[d + e*x^2])/(8*d^2*e)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^3}\,dx = -\frac{a+b\log\left(cx^n\right)}{4e\left(d+ex^2\right)^2}+\frac{(bn)\int \frac{1}{x\left(d+ex^2\right)^2}\,dx}{4e}$$

$$= -\frac{a+b\log\left(cx^n\right)}{4e\left(d+ex^2\right)^2}+\frac{(bn)\,\text{Subst}\left(\int \frac{1}{x(d+ex)^2}\,dx,x,x^2\right)}{8e}$$

$$= -\frac{a+b\log\left(cx^n\right)}{4e\left(d+ex^2\right)^2}+\frac{(bn)\,\text{Subst}\left(\int \left(\frac{1}{d^2x}-\frac{e}{d(d+ex)^2}-\frac{e}{d^2(d+ex)}\right)dx,x,x^2\right)}{8e}$$

$$= \frac{bn}{8de\left(d+ex^2\right)}+\frac{bn\log(x)}{4d^2e}-\frac{a+b\log\left(cx^n\right)}{4e\left(d+ex^2\right)^2}-\frac{bn\log\left(d+ex^2\right)}{8d^2e}$$

Mathematica [A] time = 0.07, size = 111, normalized size = 1.35

$$\frac{-a-b\left(\log\left(cx^n\right)-n\log(x)\right)}{4e\left(d+ex^2\right)^2}-\frac{bn\log\left(d+ex^2\right)}{8d^2e}+\frac{bn\log(x)}{4d^2e}+\frac{bn}{8de\left(d+ex^2\right)}-\frac{bn\log(x)}{4e\left(d+ex^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] (b*n)/(8*d*e*(d + e*x^2)) + (b*n*Log[x])/(4*d^2*e) - (b*n*Log[x])/(4*e*(d +
 e*x^2)^2) + (-a - b*(-(n*Log[x]) + Log[c*x^n]))/(4*e*(d + e*x^2)^2) - (b*n
*Log[d + e*x^2])/(8*d^2*e)
```

fricas [A] time = 0.67, size = 118, normalized size = 1.44

$$\frac{bdenx^2+bd^2n-2\,bd^2\log(c)-2\,ad^2-\left(be^2nx^4+2\,bdenx^2+bd^2n\right)\log\left(ex^2+d\right)+2\left(be^2nx^4+2\,bdenx^2\right)\log(x)}{8\left(d^2e^3x^4+2\,d^3e^2x^2+d^4e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] 1/8*(b*d*e*n*x^2 + b*d^2*n - 2*b*d^2*log(c) - 2*a*d^2 - (b*e^2*n*x^4 + 2*b*
d*e*n*x^2 + b*d^2*n)*log(e*x^2 + d) + 2*(b*e^2*n*x^4 + 2*b*d*e*n*x^2)*log(x
))/(d^2*e^3*x^4 + 2*d^3*e^2*x^2 + d^4*e)
```

giac [A] time = 0.29, size = 136, normalized size = 1.66

$$-\frac{bnx^4e^2\log\left(x^2e+d\right)-2\,bnx^4e^2\log(x)+2\,bdnx^2e\log\left(x^2e+d\right)-4\,bdnx^2e\log(x)-bdnx^2e+bd^2n\log\left(x^2e+d\right.}{8\left(d^2x^4e^3+2\,d^3x^2e^2+d^4e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] -1/8*(b*n*x^4*e^2*log(x^2*e + d) - 2*b*n*x^4*e^2*log(x) + 2*b*d*n*x^2*e*log
(x^2*e + d) - 4*b*d*n*x^2*e*log(x) - b*d*n*x^2*e + b*d^2*n*log(x^2*e + d) -
 b*d^2*n + 2*b*d^2*log(c) + 2*a*d^2)/(d^2*x^4*e^3 + 2*d^3*x^2*e^2 + d^4*e)
```

maple [C] time = 0.21, size = 243, normalized size = 2.96

$$-\frac{b\ln\left(x^n\right)}{4\left(e\,x^2+d\right)^2e}-\frac{-2b\,e^2n\,x^4\ln(x)+b\,e^2n\,x^4\ln\left(e\,x^2+d\right)-4bden\,x^2\ln(x)+2bden\,x^2\ln\left(e\,x^2+d\right)-i\pi b\,d^2\text{csgn}\left(i\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x^2+d)^3,x)
```

```
[Out] -1/4*b/e/(e*x^2+d)^2*ln(x^n)-1/8*(-2*b*e^2*n*x^4*ln(x)+b*e^2*n*x^4*ln(e*x^2
+d)+I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d^2*csgn(I*c)*csgn(I*x^n)
*csgn(I*c*x^n)-I*Pi*b*d^2*csgn(I*c*x^n)^3+I*Pi*b*d^2*csgn(I*c)*csgn(I*c*x^n
)^2-4*b*d*e*n*x^2*ln(x)+2*b*d*e*n*x^2*ln(e*x^2+d)-b*d*e*n*x^2-2*b*d^2*n*ln(
x)+b*d^2*n*ln(e*x^2+d)+2*b*d^2*ln(c)-b*d^2*n+2*a*d^2)/e/d^2/(e*x^2+d)^2
```

maxima [A] time = 0.52, size = 109, normalized size = 1.33

$$\frac{1}{8}\,bn\left(\frac{1}{de^2x^2+d^2e}-\frac{\log\left(ex^2+d\right)}{d^2e}+\frac{\log\left(x^2\right)}{d^2e}\right)-\frac{b\log\left(cx^n\right)}{4\left(e^3x^4+2\,de^2x^2+d^2e\right)}-\frac{a}{4\left(e^3x^4+2\,de^2x^2+d^2e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/8*b*n*(1/(d*e^2*x^2 + d^2*e) - log(e*x^2 + d)/(d^2*e) + log(x^2)/(d^2*e))
 - 1/4*b*log(c*x^n)/(e^3*x^4 + 2*d*e^2*x^2 + d^2*e) - 1/4*a/(e^3*x^4 + 2*d*
e^2*x^2 + d^2*e)
```

mupad [B] time = 3.68, size = 109, normalized size = 1.33

$$\frac{\frac{b\,n}{2}-a+\frac{b\,e\,n\,x^2}{2\,d}}{4\,d^2\,e+8\,d\,e^2\,x^2+4\,e^3\,x^4}-\frac{b\,\ln\left(c\,x^n\right)}{4\,e\,\left(d^2+2\,d\,e\,x^2+e^2\,x^4\right)}-\frac{b\,n\,\ln\left(e\,x^2+d\right)}{8\,d^2\,e}+\frac{b\,n\,\ln(x)}{4\,d^2\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x^2)^3,x)
```

```
[Out] ((b*n)/2 - a + (b*e*n*x^2)/(2*d))/(4*d^2*e + 4*e^3*x^4 + 8*d*e^2*x^2) - (b*
log(c*x^n))/(4*e*(d^2 + e^2*x^4 + 2*d*e*x^2)) - (b*n*log(d + e*x^2))/(8*d^2
*e) + (b*n*log(x))/(4*d^2*e)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.234 $\int \frac{a+b\log(cx^n)}{x\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=115

$$-\frac{\log\left(\frac{d}{ex^2}+1\right)\left(4a+4b\log\left(cx^n\right)-3bn\right)}{8d^3}+\frac{4a+4b\log\left(cx^n\right)-bn}{8d^2\left(d+ex^2\right)}+\frac{a+b\log\left(cx^n\right)}{4d\left(d+ex^2\right)^2}+\frac{bn\text{Li}_2\left(-\frac{d}{ex^2}\right)}{4d^3}$$

```
[Out] 1/4*(a+b*ln(c*x^n))/d/(e*x^2+d)^2-1/8*ln(1+d/e/x^2)*(4*a-3*b*n+4*b*ln(c*x^n
))/d^3+1/8*(4*a-b*n+4*b*ln(c*x^n))/d^2/(e*x^2+d)+1/4*b*n*polylog(2,-d/e/x^2
)/d^3
```

Rubi [A] time = 0.22, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2340, 2345, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{4d^3}-\frac{\log\left(\frac{d}{ex^2}+1\right)\left(4a+4b\log\left(cx^n\right)-3bn\right)}{8d^3}+\frac{4a+4b\log\left(cx^n\right)-bn}{8d^2\left(d+ex^2\right)}+\frac{a+b\log\left(cx^n\right)}{4d\left(d+ex^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^2)^3),x]
```

```
[Out] (a + b*Log[c*x^n])/(4*d*(d + e*x^2)^2) - (Log[1 + d/(e*x^2)]*(4*a - 3*b*n +
 4*b*Log[c*x^n]))/(8*d^3) + (4*a - b*n + 4*b*Log[c*x^n])/(8*d^2*(d + e*x^2)
) + (b*n*PolyLog[2, -(d/(e*x^2))])/(4*d^3)
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^2)^3}\,dx = \frac{a+b\log(cx^n)}{4d(d+ex^2)^2} - \frac{\int \frac{-4a+bn-4b\log(cx^n)}{x(d+ex^2)^2}\,dx}{4d}$$

$$= \frac{a+b\log(cx^n)}{4d(d+ex^2)^2} + \frac{4a-bn+4b\log(cx^n)}{8d^2(d+ex^2)} + \frac{\int \frac{-4bn-2(-4a+bn)+8b\log(cx^n)}{x(d+ex^2)}\,dx}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4d(d+ex^2)^2} - \frac{\log\left(1+\frac{d}{ex^2}\right)\left(4a-3bn+4b\log(cx^n)\right)}{8d^3} + \frac{4a-bn+4b\log(cx^n)}{8d^2(d+ex^2)} + \cdots$$

$$= \frac{a+b\log(cx^n)}{4d(d+ex^2)^2} - \frac{\log\left(1+\frac{d}{ex^2}\right)\left(4a-3bn+4b\log(cx^n)\right)}{8d^3} + \frac{4a-bn+4b\log(cx^n)}{8d^2(d+ex^2)} + \cdots$$

Mathematica [C] time = 1.02, size = 396, normalized size = 3.44

$$\frac{\frac{4d^2(a+b\log(cx^n)-bn\log(x))}{(d+ex^2)^2} + \frac{8d(a+b\log(cx^n)-bn\log(x))}{d+ex^2} - 8\log(d+ex^2)(a+b\log(cx^n)-bn\log(x)) + 16\log(x)(a+\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^2)^3),x]
```

```
[Out] ((4*d^2*(a - b*n*Log[x] + b*Log[c*x^n]))/(d + e*x^2)^2 + (8*d*(a - b*n*Log[
x] + b*Log[c*x^n]))/(d + e*x^2) + 16*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n])
 - 8*(a - b*n*Log[x] + b*Log[c*x^n])*Log[d + e*x^2] - b*n*(d/(d - I*Sqrt[d]
*Sqrt[e]*x) + d/(d + I*Sqrt[d]*Sqrt[e]*x) + 2*Log[x] - (d*Log[x])/(Sqrt[d]
- I*Sqrt[e]*x)^2 - (d*Log[x])/(Sqrt[d] + I*Sqrt[e]*x)^2 + (5*Sqrt[e]*x*Log[
x])/((-I)*Sqrt[d] + Sqrt[e]*x) + (5*Sqrt[e]*x*Log[x])/(I*Sqrt[d] + Sqrt[e]*
x) - 8*Log[x]^2 - 6*Log[I*Sqrt[d] - Sqrt[e]*x] - 6*Log[I*Sqrt[d] + Sqrt[e]*
x] + 8*Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 8*Log[x]*Log[1 + (I*Sqrt[e]*
x)/Sqrt[d]] + 8*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 8*PolyLog[2, (I*Sqrt
[e]*x)/Sqrt[d]]))/(16*d^3)
```

fricas [F] time = 0.82, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{e^3x^7+3\,de^2x^5+3\,d^2ex^3+d^3x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^7 + 3*d*e^2*x^5 + 3*d^2*e*x^3 + d^3*x),
x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{(ex^2+d)^3x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^3*x), x)
```

maple [C] time = 0.21, size = 841, normalized size = 7.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^2+d)^3,x)
```

```
[Out] -1/4*I*b*Pi*csgn(I*c*x^n)^3/d^2/(e*x^2+d)+1/4*I*b*Pi*csgn(I*c*x^n)^3/d^3*ln
(e*x^2+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3*ln(x)+b*ln(x^n)/d^3*ln(x)+1/4*b*ln
(x^n)/d/(e*x^2+d)^2+1/2*b*ln(x^n)/d^2/(e*x^2+d)-1/2*b*ln(x^n)/d^3*ln(e*x^2+
d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2/(e*x^2+d)+1/4*a/d/(e*x^2+d)^2
+1/2*a/d^2/(e*x^2+d)-1/2*a/d^3*ln(e*x^2+d)-1/8*I*b*Pi*csgn(I*c*x^n)^3/d/(e*
x^2+d)^2+1/2*b*ln(c)/d^2/(e*x^2+d)-1/2*b*ln(c)/d^3*ln(e*x^2+d)+1/4*b*ln(c)/
d/(e*x^2+d)^2+a/d^3*ln(x)+b/d^3*ln(c)*ln(x)-1/2*b/d^3*n*ln(x)^2-1/2*b*n/d^3
*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n/d^3*dilog((e*x+(-d*e)^(1/2
))/(-d*e)^(1/2))-1/8*b*n/d^2/(e*x^2+d)+3/8*b*n/d^3*ln(e*x^2+d)-1/2*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*ln(x)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)/d^2/(e*x^2+d)+1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(e*x^
2+d)^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*ln(e*x^2+d)+1/2*b
*n/d^3*ln(x)*ln(e*x^2+d)-1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/(
e*x^2+d)^2+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/(e*x^2+d)-1/4*I*b*Pi*cs
gn(I*c*x^n)^2*csgn(I*c)/d^3*ln(e*x^2+d)+1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n
)^2/d/(e*x^2+d)^2-1/2*b*n/d^3*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2
*b*n/d^3*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*I*b*Pi*csgn(I*x^n)*
csgn(I*c*x^n)^2/d^3*ln(e*x^2+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*
ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*ln(x)-3/4*b/d^3*n*ln(x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{4}\,a\left(\frac{2\,ex^2+3\,d}{d^2e^2x^4+2\,d^3ex^2+d^4}-\frac{2\,\log\left(ex^2+d\right)}{d^3}+\frac{4\,\log(x)}{d^3}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{e^3x^7+3\,de^2x^5+3\,d^2ex^3+d^3x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*((2*e*x^2 + 3*d)/(d^2*e^2*x^4 + 2*d^3*e*x^2 + d^4) - 2*log(e*x^2 + d)
/d^3 + 4*log(x)/d^3) + b*integrate((log(c) + log(x^n))/(e^3*x^7 + 3*d*e^2*x
^5 + 3*d^2*e*x^3 + d^3*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^n\right)}{x\,{\left(e\,x^2+d\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^2)^3),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^2)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.235 $\int \frac{a+b\log(cx^n)}{x^3(d+ex^2)^3}\,dx$

Optimal. Leaf size=162

$$\frac{e\log\left(\frac{d}{ex^2}+1\right)\left(12a+12b\log\left(cx^n\right)-5bn\right)}{8d^4}-\frac{12a+12b\log\left(cx^n\right)-5bn}{8d^3x^2}+\frac{6a+6b\log\left(cx^n\right)-bn}{8d^2x^2\left(d+ex^2\right)}+\frac{a+b\log\left(cx^n\right)}{4dx^2\left(d+ex^2\right)}$$

```
[Out] -3/4*b*n/d^3/x^2+1/4*(a+b*ln(c*x^n))/d/x^2/(e*x^2+d)^2+1/8*(6*a-b*n+6*b*ln(
c*x^n))/d^2/x^2/(e*x^2+d)+1/8*(-12*a+5*b*n-12*b*ln(c*x^n))/d^3/x^2+1/8*e*ln
(1+d/e/x^2)*(12*a-5*b*n+12*b*ln(c*x^n))/d^4-3/4*b*e*n*polylog(2,-d/e/x^2)/d
^4
```

Rubi [A] time = 0.39, antiderivative size = 195, normalized size of antiderivative = 1.20, number of steps used = 8, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2340, 266, 44, 2351, 2304, 2301, 2337, 2391}

$$\frac{3ben\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4d^4}-\frac{e\left(12a+12b\log\left(cx^n\right)-5bn\right)^2}{96bd^4n}+\frac{e\log\left(\frac{ex^2}{d}+1\right)\left(12a+12b\log\left(cx^n\right)-5bn\right)}{8d^4}+\frac{6a+6b}{8d^2x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^3),x]
```

```
[Out] (-3*b*n)/(4*d^3*x^2) + (a + b*Log[c*x^n])/(4*d*x^2*(d + e*x^2)^2) + (6*a -
b*n + 6*b*Log[c*x^n])/(8*d^2*x^2*(d + e*x^2)) - (12*a - 5*b*n + 12*b*Log[c*
x^n])/(8*d^3*x^2) - (e*(12*a - 5*b*n + 12*b*Log[c*x^n])^2)/(96*b*d^4*n) + (
e*(12*a - 5*b*n + 12*b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(8*d^4) + (3*b*e*n*P
olyLog[2, -((e*x^2)/d)])/(4*d^4)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
```

```
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)^3}\,dx = \frac{a+b\log(cx^n)}{4dx^2\left(d+ex^2\right)^2} - \frac{\int \frac{-6a+bn-6b\log(cx^n)}{x^3\left(d+ex^2\right)^2}\,dx}{4d}$$

$$= \frac{a+b\log(cx^n)}{4dx^2\left(d+ex^2\right)^2} + \frac{6a-bn+6b\log(cx^n)}{8d^2x^2\left(d+ex^2\right)} + \frac{\int \frac{-6bn-4(-6a+bn)+24b\log(cx^n)}{x^3\left(d+ex^2\right)}\,dx}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4dx^2\left(d+ex^2\right)^2} + \frac{6a-bn+6b\log(cx^n)}{8d^2x^2\left(d+ex^2\right)} + \frac{\int \left(\frac{-6bn-4(-6a+bn)+24b\log(cx^n)}{dx^3} - \frac{e\left(-6bn-4(-6a+bn)\right.}{d^2x}\right.}{8}$$

$$= \frac{a+b\log(cx^n)}{4dx^2\left(d+ex^2\right)^2} + \frac{6a-bn+6b\log(cx^n)}{8d^2x^2\left(d+ex^2\right)} + \frac{\int \frac{-6bn-4(-6a+bn)+24b\log(cx^n)}{x^3}\,dx}{8d^3} - e\int \frac{-6bn-4(-6}{}$$

$$= -\frac{3bn}{4d^3x^2} + \frac{a+b\log(cx^n)}{4dx^2\left(d+ex^2\right)^2} + \frac{6a-bn+6b\log(cx^n)}{8d^2x^2\left(d+ex^2\right)} - \frac{12a-5bn+12b\log(cx^n)}{8d^3x^2} - \frac{e\left(12a\right.}{}$$

$$= -\frac{3bn}{4d^3x^2} + \frac{a+b\log(cx^n)}{4dx^2\left(d+ex^2\right)^2} + \frac{6a-bn+6b\log(cx^n)}{8d^2x^2\left(d+ex^2\right)} - \frac{12a-5bn+12b\log(cx^n)}{8d^3x^2} - \frac{e\left(12a\right.}{}$$

Mathematica [C] time = 1.27, size = 507, normalized size = 3.13

$$\frac{-\frac{4d^2e\left(a+b\log(cx^n)-bn\log(x)\right)}{\left(d+ex^2\right)^2} - \frac{16de\left(a+b\log(cx^n)-bn\log(x)\right)}{d+ex^2} + 24e\log\left(d+ex^2\right)\left(a+b\log(cx^n)-bn\log(x)\right) - \frac{8d\left(a+b\log(cx^n\right.}{x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^3),x]
```

```
[Out] ((-8*d*(a - b*n*Log[x] + b*Log[c*x^n]))/x^2 - (4*d^2*e*(a - b*n*Log[x] + b*
Log[c*x^n]))/(d + e*x^2)^2 - (16*d*e*(a - b*n*Log[x] + b*Log[c*x^n]))/(d +
e*x^2) - 48*e*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n]) + 24*e*(a - b*n*Log[x]
 + b*Log[c*x^n])*Log[d + e*x^2] + b*n*((9*e^(3/2)*x*Log[x])/((-I)*Sqrt[d] +
 Sqrt[e]*x) - 24*e*Log[x]^2 - (4*d*(1 + 2*Log[x]))/x^2 + e*(d/(d + I*Sqrt[d
]*Sqrt[e]*x) + Log[x] - (d*Log[x])/(Sqrt[d] + I*Sqrt[e]*x)^2 - Log[I*Sqrt[d
] - Sqrt[e]*x]) - 9*e*Log[I*Sqrt[d] - Sqrt[e]*x] + e*(d/(d - I*Sqrt[d]*Sqrt
[e]*x) + Log[x] - (d*Log[x])/(Sqrt[d] - I*Sqrt[e]*x)^2 - Log[I*Sqrt[d] + Sq
rt[e]*x]) + ((-9*I)*e^(3/2)*x*Log[x] + (9*I)*e*(I*Sqrt[d] + Sqrt[e]*x)*Log[
I*Sqrt[d] + Sqrt[e]*x])/(Sqrt[d] - I*Sqrt[e]*x) + 24*e*(Log[x]*Log[1 + (I*S
qrt[e]*x)/Sqrt[d]] + PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]]) + 24*e*(Log[x]*L
og[1 - (I*Sqrt[e]*x)/Sqrt[d]] + PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])))/(16*d^
4)
```

fricas [F] time = 0.68, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^3x^9+3\,de^2x^7+3\,d^2ex^5+d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^9 + 3*d*e^2*x^7 + 3*d^2*e*x^5 + d^3*x^3)
, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^3x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^3*x^3), x)
```

maple [C] time = 0.22, size = 1030, normalized size = 6.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(e*x^2+d)^3,x)
```

```
[Out] -1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^3/(e*x^2+d)+3/2*b/d^4*e*n*ln(x)^2
-3*b/d^4*e*ln(c)*ln(x)+1/4*I*b*Pi*csgn(I*c*x^n)^3/d^3/x^2-3/2*I*b*Pi*csgn(I
*x^n)*csgn(I*c*x^n)^2/d^4*e*ln(x)-1/2*b*ln(x^n)/d^3/x^2+3/2*a*e/d^4*ln(e*x^
2+d)-1/4*a*e/d^2/(e*x^2+d)^2-a*e/d^3/(e*x^2+d)+1/8*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*e/d^2/(e*x^2+d)^2-1/2*b/d^3/x^2*ln(c)+3/2*b*n/d^4*e*ln(x
)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/2*b*n/d^4*e*ln(x)*ln((-e*x+(-d*e)^(
1/2))/(-d*e)^(1/2))+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e*ln
(x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^3/(e*x^2+d)-3/2*b*n/
d^4*e*ln(x)*ln(e*x^2+d)-3*a/d^4*e*ln(x)-3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)/d^4*e*ln(x)-1/2*a/d^3/x^2-3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/
d^4*e*ln(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3/x^2-3/
4*I*b*Pi*csgn(I*c*x^n)^3/d^4*e*ln(e*x^2+d)+3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2/d^4*e*ln(e*x^2+d)+3/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e*ln(e*x^
```

```
2+d)+1/8*I*b*Pi*csgn(I*c*x^n)^3*e/d^2/(e*x^2+d)^2-1/4*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)^2/d^3/x^2+3/2*I*b*Pi*csgn(I*c*x^n)^3/d^4*e*ln(x)-1/4*I*b*Pi*csg
n(I*c*x^n)^2*csgn(I*c)/d^3/x^2-1/4*b/d^3*n/x^2-1/8*I*b*Pi*csgn(I*c*x^n)^2*c
sgn(I*c)*e/d^2/(e*x^2+d)^2+3/2*b*n/d^4*e*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(
1/2))+3/2*b*n/d^4*e*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/8*b*n*e/d^3/(e
*x^2+d)-5/8*b*n/d^4*e*ln(e*x^2+d)-b*ln(x^n)*e/d^3/(e*x^2+d)-3*b*ln(x^n)/d^4
*e*ln(x)+3/2*b*ln(x^n)*e/d^4*ln(e*x^2+d)-1/4*b*ln(x^n)*e/d^2/(e*x^2+d)^2-1/
2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^3/(e*x^2+d)-1/8*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)^2*e/d^2/(e*x^2+d)^2-1/4*b*ln(c)*e/d^2/(e*x^2+d)^2-b*ln(c)*e/
d^3/(e*x^2+d)+3/2*b*ln(c)/d^4*e*ln(e*x^2+d)+1/2*I*b*Pi*csgn(I*c*x^n)^3*e/d^
3/(e*x^2+d)+5/4*b/d^4*e*n*ln(x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{4}a\left(\frac{6e^2x^4+9dex^2+2d^2}{d^3e^2x^6+2d^4ex^4+d^5x^2}-\frac{6e\log\left(ex^2+d\right)}{d^4}+\frac{12e\log(x)}{d^4}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{e^3x^9+3de^2x^7+3d^2ex^5+d^3x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*((6*e^2*x^4 + 9*d*e*x^2 + 2*d^2)/(d^3*e^2*x^6 + 2*d^4*e*x^4 + d^5*x^
2) - 6*e*log(e*x^2 + d)/d^4 + 12*e*log(x)/d^4) + b*integrate((log(c) + log(
x^n))/(e^3*x^9 + 3*d*e^2*x^7 + 3*d^2*e*x^5 + d^3*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,{\left(e\,x^2+d\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)^3),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.236 $\int \frac{x^4(a+b\log(cx^n))}{(d+ex^2)^3} dx$

Optimal. Leaf size=211

$$\frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{8\sqrt{d}\,e^{5/2}}-\frac{5x\left(a+b\log\left(cx^n\right)\right)}{8e^2\left(d+ex^2\right)}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{4e^2\left(d+ex^2\right)^2}-\frac{3ibn\mathrm{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16\sqrt{d}\,e^{5/2}}+\frac{3ibn\mathrm{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16\sqrt{d}\,e^{5/2}}-$$

```
[Out] -1/8*b*n*x/e^2/(e*x^2+d)+1/4*d*x*(a+b*ln(c*x^n))/e^2/(e*x^2+d)^2-5/8*x*(a+b
*ln(c*x^n))/e^2/(e*x^2+d)+1/2*b*n*arctan(x*e^(1/2)/d^(1/2))/e^(5/2)/d^(1/2)
+3/8*arctan(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/e^(5/2)/d^(1/2)-3/16*I*b*n*p
olylog(2,-I*x*e^(1/2)/d^(1/2))/e^(5/2)/d^(1/2)+3/16*I*b*n*polylog(2,I*x*e^(
1/2)/d^(1/2))/e^(5/2)/d^(1/2)
```

Rubi [A] time = 0.46, antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {288, 205, 2351, 2323, 2324, 12, 4848, 2391, 199}

$$-\frac{3ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16\sqrt{d}\,e^{5/2}}+\frac{3ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16\sqrt{d}\,e^{5/2}}-\frac{5x\left(a+b\log\left(cx^n\right)\right)}{8e^2\left(d+ex^2\right)}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{4e^2\left(d+ex^2\right)^2}+\frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{8\sqrt{\ }}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] -(b*n*x)/(8*e^2*(d + e*x^2)) + (b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*Sqrt[d]
*e^(5/2)) + (d*x*(a + b*Log[c*x^n]))/(4*e^2*(d + e*x^2)^2) - (5*x*(a + b*Lo
g[c*x^n]))/(8*e^2*(d + e*x^2)) + (3*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[
c*x^n]))/(8*Sqrt[d]*e^(5/2)) - (((3*I)/16)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/
Sqrt[d]])/(Sqrt[d]*e^(5/2)) + (((3*I)/16)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt
[d]])/(Sqrt[d]*e^(5/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{x^4\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^3}\,dx=\int\left(\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)^3}-\frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)^2}+\frac{a+b\log\left(cx^n\right)}{e^2\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int\frac{a+b\log(cx^n)}{d+ex^2}dx}{e^2}-\frac{(2d)\int\frac{a+b\log(cx^n)}{\left(d+ex^2\right)^2}dx}{e^2}+\frac{d^2\int\frac{a+b\log(cx^n)}{\left(d+ex^2\right)^3}dx}{e^2}$$

$$=\frac{dx\left(a+b\log\left(cx^n\right)\right)}{4e^2\left(d+ex^2\right)^2}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}e^{5/2}}-\int\frac{a+b}{}$$

$$=-\frac{bnx}{8e^2\left(d+ex^2\right)}+\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}e^{5/2}}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{4e^2\left(d+ex^2\right)^2}-\frac{5x\left(a+b\log\left(cx^n\right)\right)}{8e^2\left(d+ex^2\right)}+$$

$$=-\frac{bnx}{8e^2\left(d+ex^2\right)}+\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{5/2}}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{4e^2\left(d+ex^2\right)^2}-\frac{5x\left(a+b\log\left(cx^n\right)\right)}{8e^2\left(d+ex^2\right)}+$$

$$=-\frac{bnx}{8e^2\left(d+ex^2\right)}+\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{5/2}}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{4e^2\left(d+ex^2\right)^2}-\frac{5x\left(a+b\log\left(cx^n\right)\right)}{8e^2\left(d+ex^2\right)}+$$

$$=-\frac{bnx}{8e^2\left(d+ex^2\right)}+\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{5/2}}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{4e^2\left(d+ex^2\right)^2}-\frac{5x\left(a+b\log\left(cx^n\right)\right)}{8e^2\left(d+ex^2\right)}+$$

$$=-\frac{bnx}{8e^2\left(d+ex^2\right)}+\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{5/2}}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{4e^2\left(d+ex^2\right)^2}-\frac{5x\left(a+b\log\left(cx^n\right)\right)}{8e^2\left(d+ex^2\right)}+$$

Mathematica [B] time = 1.27, size = 495, normalized size = 2.35

$$\frac{-\frac{3\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)\left(a+b\log(cx^n)\right)}{\sqrt{-d}}+\frac{3\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\left(a+b\log(cx^n)\right)}{\sqrt{-d}}+\frac{5\left(a+b\log(cx^n)\right)}{\sqrt{-d}-\sqrt{e}x}-\frac{5\left(a+b\log(cx^n)\right)}{\sqrt{-d}+\sqrt{e}x}-\frac{\sqrt{-d}\left(a+b\log(cx^n)\right)}{\left(\sqrt{-d}-\sqrt{e}x\right)^2}+\frac{\sqrt{-d}\left(a+b\right.}{\left(\sqrt{-d}+\right.}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] (-((Sqrt[-d]*(a + b*Log[c*x^n]))/(Sqrt[-d] - Sqrt[e]*x)^2) + (5*(a + b*Log[
c*x^n]))/(Sqrt[-d] - Sqrt[e]*x) + (Sqrt[-d]*(a + b*Log[c*x^n]))/(Sqrt[-d] +
 Sqrt[e]*x)^2 - (5*(a + b*Log[c*x^n]))/(Sqrt[-d] + Sqrt[e]*x) - (5*b*n*(Log
[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/Sqrt[-d] + (5*b*n*(Log[x] - Log[Sqrt[-d]
+ Sqrt[e]*x]))/Sqrt[-d] - (b*n*(d + (d - Sqrt[-d]*Sqrt[e]*x)*Log[x] + (-d +
 Sqrt[-d]*Sqrt[e]*x)*Log[Sqrt[-d] + Sqrt[e]*x]))/(d*(Sqrt[-d] + Sqrt[e]*x))
 - (3*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/Sqrt[-d] + (b*n*(d
+ (d + Sqrt[-d]*Sqrt[e]*x)*Log[x] - (d + Sqrt[-d]*Sqrt[e]*x)*Log[(-d)^(3/2)
 + d*Sqrt[e]*x]))/(d*(Sqrt[-d] - Sqrt[e]*x)) + (3*(a + b*Log[c*x^n])*Log[1
+ (d*Sqrt[e]*x)/(-d)^(3/2)])/Sqrt[-d] + (3*b*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[
-d]])/Sqrt[-d] - (3*b*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/Sqrt[-d])/(16
*e^(5/2))
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{bx^4\log\left(cx^n\right)+ax^4}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")

[Out] integral((b*x^4*log(c*x^n) + a*x^4)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3), x)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)x^{4}}{\left(ex^{2}+d\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")

[Out] integrate((b*log(c*x^n) + a)*x^4/(e*x^2 + d)^3, x)

maple [C] time = 0.36, size = 1311, normalized size = 6.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^4*(b*ln(c*x^n)+a)/(e*x^2+d)^3,x)

[Out] 3/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/(e*x^2+d)^2*d/e^2*x-3/8*b*ln(c)/(e*x^2+d)^2*d/e^2*x-3/8*b/e^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*n*ln(x)+1/2*b*n/e^2/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n/e^2/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-b*n/e^2*ln(x)*x/(e*x^2+d)+b*n/e*ln(x)/(e*x^2+d)^2*x^3-5/8*a/(e*x^2+d)^2/e*x^3+3/8*a/e^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+3/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-5/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/(e*x^2+d)^2/e*x^3+3/16*b*n*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^4-3/16*b*n*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^4+b*n*d/e^2*ln(x)/(e*x^2+d)^2*x+3/8*b*n*d/e*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2-3/8*b*n*d/e*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2-3/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+5/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/(e*x^2+d)^2/e*x^3-3/8*b/(e*x^2+d)^2*d/e^2*x*ln(x^n)-5/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/(e*x^2+d)^2/e*x^3-3/16*I*b*Pi*csgn(I*c*x^n)^3/e^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-3/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/(e*x^2+d)^2*d/e^2*x+5/16*I*b*Pi*csgn(I*c*x^n)^3/(e*x^2+d)^2/e*x^3-3/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/(e*x^2+d)^2*d/e^2*x+1/2*b*n*d/e^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/16*b*n*d^2/e^2*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/16*b*n*d^2/e^2*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+1/2*b*n/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2-1/2*b*n*d/e^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-5/8*b/(e*x^2+d)^2/e*x^3*ln(x^n)+3/8*b/e^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*ln(x^n)-3/8*a/(e*x^2+d)^2*d/e^2*x+3/8*b*ln(c)/e^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-5/8*b*ln(c)/(e*x^2+d)^2/e*x^3+1/2*b*n/e^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+3/16*b*n/e^2/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/16*b*n/e^2/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/16*I*b*Pi*csgn(I*c*x^n)^3/(e*x^2+d)^2*d/e^2*x-1/8*b*n*x/e^2/(e*x^2+d)

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(e\,x^2+d\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*log(c*x^n)))/(d + e*x^2)^3,x)
```

```
[Out] int((x^4*(a + b*log(c*x^n)))/(d + e*x^2)^3, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.237 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex^2)^3} dx$

Optimal. Leaf size=187

$$\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{8d^{3/2}e^{3/2}}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{8de\left(d+ex^2\right)}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{4e\left(d+ex^2\right)^2}-\frac{ibn\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{3/2}e^{3/2}}+\frac{ibn\text{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{3/2}e^{3/2}}+\frac{bnx}{8de\left(d+\right.}$$

```
[Out] 1/8*b*n*x/d/e/(e*x^2+d)-1/4*x*(a+b*ln(c*x^n))/e/(e*x^2+d)^2+1/8*x*(a+b*ln(c
*x^n))/d/e/(e*x^2+d)+1/8*arctan(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/d^(3/2)/
e^(3/2)-1/16*I*b*n*polylog(2,-I*x*e^(1/2)/d^(1/2))/d^(3/2)/e^(3/2)+1/16*I*b
*n*polylog(2,I*x*e^(1/2)/d^(1/2))/d^(3/2)/e^(3/2)
```

Rubi [A] time = 0.37, antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {288, 199, 205, 2351, 2323, 2324, 12, 4848, 2391}

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{3/2}e^{3/2}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{3/2}e^{3/2}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{8d^{3/2}e^{3/2}}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{8de\left(d+ex^2\right)}-\frac{x\left(a+b\log\right.}{4e\left(d+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] (b*n*x)/(8*d*e*(d + e*x^2)) - (x*(a + b*Log[c*x^n]))/(4*e*(d + e*x^2)^2) +
(x*(a + b*Log[c*x^n]))/(8*d*e*(d + e*x^2)) + (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(
a + b*Log[c*x^n]))/(8*d^(3/2)*e^(3/2)) - ((I/16)*b*n*PolyLog[2, ((-I)*Sqrt[
e]*x)/Sqrt[d]])/(d^(3/2)*e^(3/2)) + ((I/16)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sq
rt[d]])/(d^(3/2)*e^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^3}\,dx = \int\left(-\frac{d\left(a+b\log\left(cx^n\right)\right)}{e\left(d+ex^2\right)^3}+\frac{a+b\log\left(cx^n\right)}{e\left(d+ex^2\right)^2}\right)dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^2}\,dx}{e} - \frac{d\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^3}\,dx}{e}$$

$$= -\frac{x\left(a+b\log\left(cx^n\right)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{2de\left(d+ex^2\right)}-\frac{3\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^2}\,dx}{4e}+\frac{\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{2de}+ \ldots$$

$$= \frac{bnx}{8de\left(d+ex^2\right)}-\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}e^{3/2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{8de\left(d+ex^2\right)}+\frac{\tan^{-1}\left(\ldots\right.}{\ldots}$$

$$= \frac{bnx}{8de\left(d+ex^2\right)}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{8de\left(d+ex^2\right)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(c\ldots\right.\right.}{8d^{3/2}e^{3/2}}$$

$$= \frac{bnx}{8de\left(d+ex^2\right)}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{8de\left(d+ex^2\right)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(c\ldots\right.\right.}{8d^{3/2}e^{3/2}}$$

$$= \frac{bnx}{8de\left(d+ex^2\right)}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{8de\left(d+ex^2\right)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(c\ldots\right.\right.}{8d^{3/2}e^{3/2}}$$

$$= \frac{bnx}{8de\left(d+ex^2\right)}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{8de\left(d+ex^2\right)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(c\ldots\right.\right.}{8d^{3/2}e^{3/2}}$$

Mathematica [B] time = 1.08, size = 497, normalized size = 2.66

$$\frac{\frac{\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)\left(a+b\log\left(cx^n\right)\right)}{(-d)^{3/2}}+\frac{d\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\left(a+b\log\left(cx^n\right)\right)}{(-d)^{5/2}}-\frac{a+b\log\left(cx^n\right)}{\sqrt{-d}d-d\sqrt{e}x}+\frac{a+b\log\left(cx^n\right)}{d\sqrt{e}x+\sqrt{-d}d}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)^2}+\frac{a+b\log\left(cx^n\right)}{\sqrt{-d}\left(\sqrt{-d}+\sqrt{e}x\right)^2}\ldots}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] ((d*(a + b*Log[c*x^n]))/((-d)^(3/2)*(Sqrt[-d] - Sqrt[e]*x)^2) + (a + b*Log[
c*x^n])/(Sqrt[-d]*(Sqrt[-d] + Sqrt[e]*x)^2) - (a + b*Log[c*x^n])/(Sqrt[-d]*
d - d*Sqrt[e]*x) + (a + b*Log[c*x^n])/(Sqrt[-d]*d + d*Sqrt[e]*x) + (b*d*n*(
Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/(-d)^(5/2) + (b*n*(Log[x] - Log[Sqrt[-
d] + Sqrt[e]*x]))/(-d)^(3/2) + (b*n*(d + (d - Sqrt[-d]*Sqrt[e]*x)*Log[x] +
(-d + Sqrt[-d]*Sqrt[e]*x)*Log[Sqrt[-d] + Sqrt[e]*x]))/(d^2*(Sqrt[-d] + Sqrt
[e]*x)) + ((a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(3/2) - (
b*n*(d + (d + Sqrt[-d]*Sqrt[e]*x)*Log[x] - (d + Sqrt[-d]*Sqrt[e]*x)*Log[(-d
)^(3/2) + d*Sqrt[e]*x]))/(d^2*(Sqrt[-d] - Sqrt[e]*x)) + (d*(a + b*Log[c*x^n
])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(5/2) + (b*d*n*PolyLog[2, (Sqrt[
e]*x)/Sqrt[-d]])/(-d)^(5/2) + (b*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-
d)^(3/2))/(16*e^(3/2))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\log\left(cx^n\right)+ax^2}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log \left(cx^{n}\right) + a\right)x^{2}}{\left(ex^{2} + d\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^2 + d)^3, x)
```

maple [C] time = 0.36, size = 1247, normalized size = 6.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(e*x^2+d)^3,x)
```

```
[Out] 1/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/(e*x^2+d)^2/d*x^3-1/2*b*n/d*ln(x)/(e*
x^2+d)^2*x^3-1/2*b*n/e*ln(x)/(e*x^2+d)^2*x+1/16*b*n/d/e/(-d*e)^(1/2)*dilog(
(-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/16*b*n/d/e/(-d*e)^(1/2)*dilog((e*x+(-d*
e)^(1/2))/(-d*e)^(1/2))+1/8*a/(e*x^2+d)^2/d*x^3-1/8*a/(e*x^2+d)^2/e*x-3/16*
b*n*d/e*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))
+3/16*b*n*d/e*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(
1/2))+1/4*b*n*ln(x)/d/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^
(1/2))*x^2-1/4*b*n*ln(x)/d/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d
*e)^(1/2))*x^2+1/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/(e*x^2+d)^2/d*x^3-3/
16*b*n/d*e*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/
2))*x^4+3/16*b*n/d*e*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(
-d*e)^(1/2))*x^4+1/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e/d/(d*e)^(1/2)*arct
an(1/(d*e)^(1/2)*e*x)-1/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/(e*x^
2+d)^2/d*x^3+1/8*b*ln(c)/e/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/16*I*b
*Pi*csgn(I*c*x^n)^3/e/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/16*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x
)+1/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e/d/(d*e)^(1/2)*arctan(1/(d*e)^(1
/2)*e*x)+1/8*b/e/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*ln(x^n)-1/16*I*b*P
i*csgn(I*c*x^n)^3/(e*x^2+d)^2/d*x^3+1/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)/(e*x^2+d)^2/e*x+1/16*I*b*Pi*csgn(I*c*x^n)^3/(e*x^2+d)^2/e*x+1/8*a/
e/d/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/8*b*ln(c)/(e*x^2+d)^2/e*x+1/8*b
*ln(c)/(e*x^2+d)^2/d*x^3-1/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/(e*x^2+d)^2/
e*x-1/8*b/(e*x^2+d)^2/e*x*ln(x^n)+1/8*b/(e*x^2+d)^2/d*x^3*ln(x^n)-1/16*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/(e*x^2+d)^2/e*x-1/8*b/e/d/(d*e)^(1/2)*arctan
(1/(d*e)^(1/2)*e*x)*n*ln(x)-3/8*b*n*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x
+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+3/8*b*n*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln(
(e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+1/4*b*n/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)
*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*n/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2
)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n/e*ln(x)*x/d/(e*x^2+d)+1/8*b*n
*x/d/e/(e*x^2+d)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,(a+b\,\ln(c\,x^n))}{\left(e\,x^2+d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2)^3,x)
```

```
[Out] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.238 $\int \frac{a+b\log(cx^n)}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=210

$$\frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{8d^{5/2}\sqrt{e}}+\frac{3x\left(a+b\log\left(cx^n\right)\right)}{8d^2\left(d+ex^2\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{4d\left(d+ex^2\right)^2}-\frac{3ibn\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{5/2}\sqrt{e}}+\frac{3ibn\text{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{5/2}\sqrt{e}}-$$

```
[Out] -1/8*b*n*x/d^2/(e*x^2+d)+1/4*x*(a+b*ln(c*x^n))/d/(e*x^2+d)^2+3/8*x*(a+b*ln(
c*x^n))/d^2/(e*x^2+d)-1/2*b*n*arctan(x*e^(1/2)/d^(1/2))/d^(5/2)/e^(1/2)+3/8
*arctan(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))/d^(5/2)/e^(1/2)-3/16*I*b*n*polyl
og(2,-I*x*e^(1/2)/d^(1/2))/d^(5/2)/e^(1/2)+3/16*I*b*n*polylog(2,I*x*e^(1/2)
/d^(1/2))/d^(5/2)/e^(1/2)
```

Rubi [A] time = 0.15, antiderivative size = 210, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {2323, 205, 2324, 12, 4848, 2391, 199}

$$-\frac{3ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{5/2}\sqrt{e}}+\frac{3ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{5/2}\sqrt{e}}+\frac{3x\left(a+b\log\left(cx^n\right)\right)}{8d^2\left(d+ex^2\right)}+\frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{8d^{5/2}\sqrt{e}}+\frac{x(}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^2)^3,x]
```

```
[Out] -(b*n*x)/(8*d^2*(d + e*x^2)) - (b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*d^(5/2)
*Sqrt[e]) + (x*(a + b*Log[c*x^n]))/(4*d*(d + e*x^2)^2) + (3*x*(a + b*Log[c*
x^n]))/(8*d^2*(d + e*x^2)) + (3*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^
n]))/(8*d^(5/2)*Sqrt[e]) - (((3*I)/16)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt
[d]])/(d^(5/2)*Sqrt[e]) + (((3*I)/16)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]]
)/(d^(5/2)*Sqrt[e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex^2)^3}dx = \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3\int \frac{a+b\log(cx^n)}{(d+ex^2)^2}dx}{4d} - \frac{(bn)\int \frac{1}{(d+ex^2)^2}dx}{4d}$$

$$= -\frac{bnx}{8d^2(d+ex^2)} + \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3x(a+b\log(cx^n))}{8d^2(d+ex^2)} + \frac{3\int \frac{a+b\log(cx^n)}{d+ex^2}dx}{8d^2} - \frac{(bn)\int}{8}$$

$$= -\frac{bnx}{8d^2(d+ex^2)} - \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3x(a+b\log(cx^n))}{8d^2(d+ex^2)} + \frac{3\tan^{-1}(}{}$$

$$= -\frac{bnx}{8d^2(d+ex^2)} - \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3x(a+b\log(cx^n))}{8d^2(d+ex^2)} + \frac{3\tan^{-1}(}{}$$

$$= -\frac{bnx}{8d^2(d+ex^2)} - \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3x(a+b\log(cx^n))}{8d^2(d+ex^2)} + \frac{3\tan^{-1}(}{}$$

$$= -\frac{bnx}{8d^2(d+ex^2)} - \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3x(a+b\log(cx^n))}{8d^2(d+ex^2)} + \frac{3\tan^{-1}(}{}$$

Mathematica [B] time = 0.95, size = 544, normalized size = 2.59

$$\frac{1}{16}\left(\frac{3(a+b\log(cx^n))}{d^2ex+(-d)^{5/2}\sqrt{e}} + \frac{3(a+b\log(cx^n))}{d^2ex+(-d)^{3/2}d\sqrt{e}} - \frac{3\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n))}{(-d)^{5/2}\sqrt{e}} + \frac{3\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)(a+b\log(}{(-d)^{5/2}\sqrt{e}}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^2)^3,x]
```

```
[Out] ((d*(a + b*Log[c*x^n]))/((-d)^(5/2)*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)^2) + (a
+ b*Log[c*x^n])/((-d)^(3/2)*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)^2) + (3*(a + b*L
og[c*x^n]))/((-d)^(5/2)*Sqrt[e] + d^2*e*x) + (3*(a + b*Log[c*x^n]))/((-d)^(
3/2)*d*Sqrt[e] + d^2*e*x) + (3*b*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/((
```

```
-d)^(5/2)*Sqrt[e]) - (3*b*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/((-d)^(5/
2)*Sqrt[e]) - (b*n*(d + (d - Sqrt[-d]*Sqrt[e]*x)*Log[x] + (-d + Sqrt[-d]*Sq
rt[e]*x)*Log[Sqrt[-d] + Sqrt[e]*x]))/(d^3*(Sqrt[-d]*Sqrt[e] + e*x)) - (3*(a
 + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/((-d)^(5/2)*Sqrt[e]) - (b*n
*(d + (d + Sqrt[-d]*Sqrt[e]*x)*Log[x] - (d + Sqrt[-d]*Sqrt[e]*x)*Log[(-d)^(
3/2) + d*Sqrt[e]*x]))/((-d)^(7/2)*Sqrt[e] + d^3*e*x) + (3*(a + b*Log[c*x^n]
)*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/((-d)^(5/2)*Sqrt[e]) + (3*b*n*PolyLog[
2, (Sqrt[e]*x)/Sqrt[-d]])/((-d)^(5/2)*Sqrt[e]) - (3*b*n*PolyLog[2, (d*Sqrt[
e]*x)/(-d)^(3/2)])/((-d)^(5/2)*Sqrt[e]))/16
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{3}x^{6}+3\,de^{2}x^{4}+3\,d^{2}ex^{2}+d^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\log\left(cx^{n}\right)+a}{\left(ex^{2}+d\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^2 + d)^3, x)
```

maple [C] time = 0.34, size = 1047, normalized size = 4.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x^2+d)^3,x)
```

```
[Out] 3/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*
e*x)-3/16*b*n*ln(x)/d^2/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*
e)^(1/2))*x^4*e^2+3/8*b*n*ln(x)/d/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^
(1/2))/(-d*e)^(1/2))*x^2*e-3/8*b*n*ln(x)/d/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x
+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2*e-3/8*b/d^2*x/(e*x^2+d)*n*ln(x)+3/16*b*n*l
n(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/16*b*n
*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/16*b*
n*ln(x)/d^2/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x
^4*e^2+3/8*b*n*ln(x)/d^2/(e*x^2+d)^2*x^3*e-3/8*b/d^2/(d*e)^(1/2)*arctan(1/(
d*e)^(1/2)*e*x)*n*ln(x)+1/4*a*x/d/(e*x^2+d)^2+3/8*a/d^2*x/(e*x^2+d)+3/8*a/d
^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+3/8*b*n*ln(x)/d/(e*x^2+d)^2*x-3/16
*I*b*Pi*csgn(I*c*x^n)^3/d^2*x/(e*x^2+d)+3/8*b*ln(c)/d^2*x/(e*x^2+d)+3/8*b*l
n(c)/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+1/4*b*ln(c)*x/d/(e*x^2+d)^2-
1/2*b*n/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+3/16*b*n/d^2/(-d*e)^(1/2)
*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/16*b*n/d^2/(-d*e)^(1/2)*dilog((e
*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*x/
(e*x^2+d)-3/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*x/(e*x^2+d)-3
/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/(d*e)^(1/2)*arctan(1/(d*
e)^(1/2)*e*x)-1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x/d/(e*x^2+d)^
2+1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*x/d/(e*x^2+d)^2+3/16*I*b*Pi*csgn(I
*x^n)*csgn(I*c*x^n)^2/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/8*I*b*Pi*
```

```
csgn(I*c*x^n)^3*x/d/(e*x^2+d)^2+1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*x/d/(e
*x^2+d)^2+3/8*b/d^2/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*ln(x^n)+3/8*b/d^2
*x/(e*x^2+d)*ln(x^n)+1/4*b*x/d/(e*x^2+d)^2*ln(x^n)+3/16*I*b*Pi*csgn(I*x^n)*
csgn(I*c*x^n)^2/d^2*x/(e*x^2+d)-3/16*I*b*Pi*csgn(I*c*x^n)^3/d^2/(d*e)^(1/2)
*arctan(1/(d*e)^(1/2)*e*x)-1/8*b*n*x/d^2/(e*x^2+d)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{{\left(e\,x^2+d\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x^2)^3,x)
```

```
[Out] int((a + b*log(c*x^n))/(d + e*x^2)^3, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.239 $\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)^3} dx$

Optimal. Leaf size=219

$$-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(15a+15b\log(cx^n)-8bn)}{8d^{7/2}}-\frac{15a+15b\log(cx^n)-8bn}{8d^3x}+\frac{5a+5b\log(cx^n)-bn}{8d^2x(d+ex^2)}+\frac{a+b\log(}{4dx(d+e}$$

```
[Out] -15/8*b*n/d^3/x+1/4*(a+b*ln(c*x^n))/d/x/(e*x^2+d)^2+1/8*(5*a-b*n+5*b*ln(c*x
^n))/d^2/x/(e*x^2+d)+1/8*(-15*a+8*b*n-15*b*ln(c*x^n))/d^3/x-1/8*arctan(x*e^
(1/2)/d^(1/2))*(15*a-8*b*n+15*b*ln(c*x^n))*e^(1/2)/d^(7/2)+15/16*I*b*n*poly
log(2,-I*x*e^(1/2)/d^(1/2))*e^(1/2)/d^(7/2)-15/16*I*b*n*polylog(2,I*x*e^(1/
2)/d^(1/2))*e^(1/2)/d^(7/2)
```

Rubi [A] time = 0.37, antiderivative size = 219, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2340, 325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$\frac{15ib\sqrt{e}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{7/2}}-\frac{15ib\sqrt{e}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{7/2}}+\frac{5a+5b\log(cx^n)-bn}{8d^2x(d+ex^2)}-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(15a+15}{8d^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^3),x]
```

```
[Out] (-15*b*n)/(8*d^3*x) + (a + b*Log[c*x^n])/(4*d*x*(d + e*x^2)^2) + (5*a - b*n
 + 5*b*Log[c*x^n])/(8*d^2*x*(d + e*x^2)) - (15*a - 8*b*n + 15*b*Log[c*x^n])
/(8*d^3*x) - (Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(15*a - 8*b*n + 15*b*Log[
c*x^n]))/(8*d^(7/2)) + (((15*I)/16)*b*Sqrt[e]*n*PolyLog[2, ((-I)*Sqrt[e]*x)
/Sqrt[d]])/d^(7/2) - (((15*I)/16)*b*Sqrt[e]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt
[d]])/d^(7/2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)^3}\,dx = \frac{a+b\log(cx^n)}{4dx(d+ex^2)^2} - \frac{\int \frac{-5a+bn-5b\log(cx^n)}{x^2(d+ex^2)^2}dx}{4d}$$

$$= \frac{a+b\log(cx^n)}{4dx(d+ex^2)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x(d+ex^2)} + \frac{\int \frac{-5bn-3(-5a+bn)+15b\log(cx^n)}{x^2(d+ex^2)}dx}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4dx(d+ex^2)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x(d+ex^2)} + \frac{\int \left(\frac{-5bn-3(-5a+bn)+15b\log(cx^n)}{dx^2} - \frac{e(-5bn-3(-5a+b}{d(d\cdots}\right.}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4dx(d+ex^2)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x(d+ex^2)} + \frac{\int \frac{-5bn-3(-5a+bn)+15b\log(cx^n)}{x^2}dx}{8d^3} - \frac{e\int \frac{-5bn-3(}{}}{}$$

$$= -\frac{15bn}{8d^3x} + \frac{a+b\log(cx^n)}{4dx(d+ex^2)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x(d+ex^2)} - \frac{15a-8bn+15b\log(cx^n)}{8d^3x} - \frac{\sqrt{e}\,\mathrm{t}}{}$$

$$= -\frac{15bn}{8d^3x} + \frac{a+b\log(cx^n)}{4dx(d+ex^2)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x(d+ex^2)} - \frac{15a-8bn+15b\log(cx^n)}{8d^3x} - \frac{\sqrt{e}\,\mathrm{t}}{}$$

$$= -\frac{15bn}{8d^3x} + \frac{a+b\log(cx^n)}{4dx(d+ex^2)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x(d+ex^2)} - \frac{15a-8bn+15b\log(cx^n)}{8d^3x} - \frac{\sqrt{e}\,\mathrm{t}}{}$$

$$= -\frac{15bn}{8d^3x} + \frac{a+b\log(cx^n)}{4dx(d+ex^2)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x(d+ex^2)} - \frac{15a-8bn+15b\log(cx^n)}{8d^3x} - \frac{\sqrt{e}\,\mathrm{t}}{}$$

Mathematica [B] time = 1.61, size = 552, normalized size = 2.52

$$\frac{1}{16}\left(\frac{7\sqrt{e}\,(a+b\log(cx^n))}{d^3(\sqrt{-d}-\sqrt{e}x)} - \frac{7\sqrt{e}\,(a+b\log(cx^n))}{d^3(\sqrt{-d}+\sqrt{e}x)} - \frac{16(a+b\log(cx^n))}{d^3x} + \frac{d\sqrt{e}\,(a+b\log(cx^n))}{(-d)^{7/2}(\sqrt{-d}-\sqrt{e}x)^2} + \frac{\sqrt{e}\,(a}{(-d)^{5/2}(}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^3),x]
```

```
[Out] ((-16*b*n)/(d^3*x) - (16*(a + b*Log[c*x^n]))/(d^3*x) + (d*Sqrt[e]*(a + b*Lo
g[c*x^n]))/((-d)^(7/2)*(Sqrt[-d] - Sqrt[e]*x)^2) + (7*Sqrt[e]*(a + b*Log[c*
x^n]))/(d^3*(Sqrt[-d] - Sqrt[e]*x)) + (Sqrt[e]*(a + b*Log[c*x^n]))/((-d)^(5
/2)*(Sqrt[-d] + Sqrt[e]*x)^2) - (7*Sqrt[e]*(a + b*Log[c*x^n]))/(d^3*(Sqrt[-
d] + Sqrt[e]*x)) + (7*b*Sqrt[e]*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/(-d
)^(7/2) - (7*b*Sqrt[e]*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/(-d)^(7/2) +
 (b*d*Sqrt[e]*n*(1/(Sqrt[-d]*(Sqrt[-d] + Sqrt[e]*x)) - Log[x]/d + Log[Sqrt[
-d] + Sqrt[e]*x]/d))/(-d)^(7/2) - (15*Sqrt[e]*(a + b*Log[c*x^n])*Log[1 + (S
qrt[e]*x)/Sqrt[-d]])/(-d)^(7/2) + (b*Sqrt[e]*n*(1/(Sqrt[-d]*(Sqrt[-d] - Sqr
t[e]*x)) - Log[x]/d + Log[(-d)^(3/2) + d*Sqrt[e]*x]/d))/(-d)^(5/2) + (15*Sq
rt[e]*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(7/2) + (1
5*b*Sqrt[e]*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(7/2) - (15*b*Sqrt[e]*
n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(7/2))/16
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{3}x^{8}+3\,de^{2}x^{6}+3\,d^{2}ex^{4}+d^{3}x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^8 + 3*d*e^2*x^6 + 3*d^2*e*x^4 + d^3*x^2)
, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\log\left(cx^{n}\right)+a}{\left(ex^{2}+d\right)^{3}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^3*x^2), x)
```

maple [C] time = 0.39, size = 1518, normalized size = 6.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(e*x^2+d)^3,x)
```

```
[Out] 7/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3/(e*x^2+d)^2*x^3-b*l
n(x^n)/d^3/x-15/16*b*n*e/d^3/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^
(1/2))+15/16*b*n*e/d^3/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+
1/8*b*n*e/d^3*x/(e*x^2+d)+3/8*b*n*e^2/d^2*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln
((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2-a/d^3/x+15/16*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)*e/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-b/d^3/x*ln(
c)+b*n*e/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+15/16*I*b*Pi*csgn(I*c*x^
n)^3*e/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-3/8*b*n*e^2/d^2*ln(x)/(e*x
^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2-3/16*b*n*e^3/
d^3*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^4
+3/16*b*n*e^3/d^3*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*
e)^(1/2))*x^4+1/4*b*n*e^2/d^3*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(
1/2))/(-d*e)^(1/2))*x^2-1/4*b*n*e^2/d^3*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e
*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2-9/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*
e/d^2/(e*x^2+d)^2*x-15/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^3/(d*e)^(1/2
)*arctan(1/(d*e)^(1/2)*e*x)+9/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*e/d^2/(e*x^2+d)^2*x-7/8*b*ln(c)*e^2/d^3/(e*x^2+d)^2*x^3-9/8*b*ln(c)*e/d^2/
(e*x^2+d)^2*x-15/8*b*ln(c)*e/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-3/16
*b*n*e/d*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2)
)+1/4*b*n*e/d^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(
1/2))+3/16*b*n*e/d*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d
*e)^(1/2))-9/8*b*e/d^2/(e*x^2+d)^2*x*ln(x^n)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)^2/d^3/x-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3/x-b/d^3*n/x-1/4*b*n
*e/d^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-7/
8*a*e^2/d^3/(e*x^2+d)^2*x^3-9/8*a*e/d^2/(e*x^2+d)^2*x-15/8*a*e/d^3/(d*e)^(1
/2)*arctan(1/(d*e)^(1/2)*e*x)+7/16*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3/(e*x^2+d)
^2*x^3-15/8*b*e/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*ln(x^n)+1/2*I*b*P
i*csgn(I*c*x^n)^3/d^3/x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3/
x-7/8*b*e^2/d^3/(e*x^2+d)^2*x^3*ln(x^n)-7/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*
c)*e^2/d^3/(e*x^2+d)^2*x^3-9/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/(e*x
```

```
^2+d)^2*x+9/16*I*b*Pi*csgn(I*c*x^n)^3*e/d^2/(e*x^2+d)^2*x-7/16*I*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2*e^2/d^3/(e*x^2+d)^2*x^3-15/16*I*b*Pi*csgn(I*x^n)*csg
n(I*c*x^n)^2*e/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)-1/2*b*n*e/d^3*ln(x
)*x/(e*x^2+d)+1/2*b*n*e/d^3/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)
^(1/2))+1/2*b*n*e^2/d^3*ln(x)/(e*x^2+d)^2*x^3+1/2*b*n*e/d^2*ln(x)/(e*x^2+d)
^2*x-1/2*b*n*e/d^3/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+
15/8*b*e/d^3/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*n*ln(x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^2\,{\left(e\,x^2+d\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)^3),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.240 $\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)^3}\,dx$

Optimal. Leaf size=260

$$\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(35a+35b\log\left(cx^n\right)-12bn\right)}{8d^{9/2}}+\frac{e\left(35a+35b\log\left(cx^n\right)-12bn\right)}{8d^4x}-\frac{35a+35b\log\left(cx^n\right)-12bn}{24d^3x^3}+\frac{7a-}{}$$

```
[Out] -35/72*b*n/d^3/x^3+35/8*b*e*n/d^4/x+1/4*(a+b*ln(c*x^n))/d/x^3/(e*x^2+d)^2+1
/8*(7*a-b*n+7*b*ln(c*x^n))/d^2/x^3/(e*x^2+d)+1/24*(-35*a+12*b*n-35*b*ln(c*x
^n))/d^3/x^3+1/8*e*(35*a-12*b*n+35*b*ln(c*x^n))/d^4/x+1/8*e^(3/2)*arctan(x*
e^(1/2)/d^(1/2))*(35*a-12*b*n+35*b*ln(c*x^n))/d^(9/2)-35/16*I*b*e^(3/2)*n*p
olylog(2,-I*x*e^(1/2)/d^(1/2))/d^(9/2)+35/16*I*b*e^(3/2)*n*polylog(2,I*x*e^
(1/2)/d^(1/2))/d^(9/2)
```

Rubi [A] time = 0.42, antiderivative size = 260, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2340, 325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$-\frac{35ibe^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{9/2}}+\frac{35ibe^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{9/2}}+\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(35a+35b\log\left(cx^n\right)-12bn\right)}{8d^{9/2}}+\frac{e(}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^3),x]
```

```
[Out] (-35*b*n)/(72*d^3*x^3) + (35*b*e*n)/(8*d^4*x) + (a + b*Log[c*x^n])/(4*d*x^3
*(d + e*x^2)^2) + (7*a - b*n + 7*b*Log[c*x^n])/(8*d^2*x^3*(d + e*x^2)) - (3
5*a - 12*b*n + 35*b*Log[c*x^n])/(24*d^3*x^3) + (e*(35*a - 12*b*n + 35*b*Log
[c*x^n]))/(8*d^4*x) + (e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(35*a - 12*b*n +
 35*b*Log[c*x^n]))/(8*d^(9/2)) - (((35*I)/16)*b*e^(3/2)*n*PolyLog[2, ((-I)*
Sqrt[e]*x)/Sqrt[d]])/d^(9/2) + (((35*I)/16)*b*e^(3/2)*n*PolyLog[2, (I*Sqrt[
e]*x)/Sqrt[d]])/d^(9/2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4\left(d+ex^2\right)^3}\,dx = \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} - \frac{\int \frac{-7a+bn-7b\log(cx^n)}{x^4\left(d+ex^2\right)^2}\,dx}{4d}$$

$$= \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} + \frac{\int \frac{-7bn-5(-7a+bn)+35b\log(cx^n)}{x^4\left(d+ex^2\right)}\,dx}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} + \frac{\int \left(\frac{-7bn-5(-7a+bn)+35b\log(cx^n)}{dx^4} - \frac{e\left(-7bn-5(-7a+bn)\right.}{d^2x^2}\right.}{8}$$

$$= \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} + \frac{\int \frac{-7bn-5(-7a+bn)+35b\log(cx^n)}{x^4}\,dx}{8d^3} - \frac{e\int \frac{-7bn-5(-7}{}}{}$$

$$= -\frac{35bn}{72d^3x^3} + \frac{35ben}{8d^4x} + \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} - \frac{35a-12bn+35b\log(c}{24d^3x^3}$$

$$= -\frac{35bn}{72d^3x^3} + \frac{35ben}{8d^4x} + \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} - \frac{35a-12bn+35b\log(c}{24d^3x^3}$$

$$= -\frac{35bn}{72d^3x^3} + \frac{35ben}{8d^4x} + \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} - \frac{35a-12bn+35b\log(c}{24d^3x^3}$$

$$= -\frac{35bn}{72d^3x^3} + \frac{35ben}{8d^4x} + \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} - \frac{35a-12bn+35b\log(c}{24d^3x^3}$$

Mathematica [B] time = 1.67, size = 584, normalized size = 2.25

$$\frac{1}{144}\left(-\frac{99e^{3/2}\left(a+b\log(cx^n)\right)}{d^4\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{99e^{3/2}\left(a+b\log(cx^n)\right)}{d^4\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{432e\left(a+b\log(cx^n)\right)}{d^4x} - \frac{48\left(a+b\log(cx^n)\right)}{d^3x^3} - \frac{9e^{3/2}\left(\right.}{(-d)^{7/2}}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^3),x]
```

```
[Out] ((-16*b*n)/(d^3*x^3) + (432*b*e*n)/(d^4*x) - (48*(a + b*Log[c*x^n]))/(d^3*x
^3) + (432*e*(a + b*Log[c*x^n]))/(d^4*x) - (9*e^(3/2)*(a + b*Log[c*x^n]))/(
(-d)^(7/2)*(Sqrt[-d] - Sqrt[e]*x)^2) - (99*e^(3/2)*(a + b*Log[c*x^n]))/(d^4
*(Sqrt[-d] - Sqrt[e]*x)) + (9*e^(3/2)*(a + b*Log[c*x^n]))/((-d)^(7/2)*(Sqrt
[-d] + Sqrt[e]*x)^2) + (99*e^(3/2)*(a + b*Log[c*x^n]))/(d^4*(Sqrt[-d] + Sqr
t[e]*x)) + (99*b*e^(3/2)*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/(-d)^(9/2)
 - (99*b*e^(3/2)*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/(-d)^(9/2) - (9*b*
e^(3/2)*n*(1/(Sqrt[-d]*(Sqrt[-d] + Sqrt[e]*x)) - Log[x]/d + Log[Sqrt[-d] +
Sqrt[e]*x]/d))/(-d)^(7/2) - (315*e^(3/2)*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e
]*x)/Sqrt[-d]])/(-d)^(9/2) + (9*b*e^(3/2)*n*(1/(Sqrt[-d]*(Sqrt[-d] - Sqrt[e
]*x)) - Log[x]/d + Log[(-d)^(3/2) + d*Sqrt[e]*x]/d))/(-d)^(7/2) + (315*e^(3
/2)*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(9/2) + (315
*b*e^(3/2)*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(9/2) - (315*b*e^(3/2)*
n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(9/2))/144
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{3}x^{10}+3\,de^{2}x^{8}+3\,d^{2}ex^{6}+d^{3}x^{4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^10 + 3*d*e^2*x^8 + 3*d^2*e*x^6 + d^3*x^4
), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex^{2}+d\right)^{3}x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^3*x^4), x)
```

maple [C] time = 0.40, size = 1729, normalized size = 6.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^4/(e*x^2+d)^3,x)
```

```
[Out] -1/2*b*n*e^2/d^3*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^
(1/2))+3/16*b*n*e^2/d^2*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2
))/(-d*e)^(1/2))-3/16*b*n*e^2/d^2*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-
d*e)^(1/2))/(-d*e)^(1/2))-3/8*b*n*e^3/d^3*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln
((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+3/16*b*n*e^4/d^4*ln(x)/(e*x^2+d)^2/(-
d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^4-3/16*b*n*e^4/d^4*ln(x)/
(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^4+1/2*b*n*e^
3/d^4*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2
-1/2*b*n*e^3/d^4*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^
(1/2))*x^2-13/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3/(e*x^2+
d)^2*x+3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e/x+3*b/d^4*e/x*ln(c)-1/3*b
/d^3/x^3*ln(x^n)-1/3*b*ln(c)/d^3/x^3+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2
/d^4*e/x-1/3*a/d^3/x^3+b*n*e^2/d^4*ln(x)*x/(e*x^2+d)+3*a/d^4*e/x-35/16*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^4/(d*e)^(1/2)*arctan(1/(d*e)^(
1/2)*e*x)-11/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^3/d^4/(e*x^2+d
)^2*x^3+1/2*b*n*e^2/d^3*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))
/(-d*e)^(1/2))-b*n*e^3/d^4*ln(x)/(e*x^2+d)^2*x^3-b*n*e^2/d^3*ln(x)/(e*x^2+d
)^2*x-35/8*b*e^2/d^4/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)*n*ln(x)+3/2*b*n*
e^2/d^4/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/2*b*n*e^2
/d^4/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/8*b*n*e^3/d^3
*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+13
/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3/(e*x^2+d)^2*x+35/8*b*ln(c)*e^2
/d^4/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+11/8*b*ln(c)*e^3/d^4/(e*x^2+d)^2
*x^3-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e/x-3/2*I*b*Pi*csgn
(I*c*x^n)^3/d^4*e/x-1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3/x^3-1/6*I*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3/x^3+13/8*b*e^2/d^3/(e*x^2+d)^2*x*ln(x^n)+1
1/8*b*e^3/d^4/(e*x^2+d)^2*x^3*ln(x^n)+35/8*b*e^2/d^4/(d*e)^(1/2)*arctan(1/(
d*e)^(1/2)*e*x)*ln(x^n)-1/8*b*n*e^2/d^4*x/(e*x^2+d)+13/8*b*ln(c)*e^2/d^3/(e
*x^2+d)^2*x-13/16*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3/(e*x^2+d)^2*x+1/6*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3/x^3-3/2*b*n*e^2/d^4/(d*e)^(1/2)*arct
```

```
an(1/(d*e)^(1/2)*e*x)+35/16*b*n*e^2/d^4/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/
2))/(-d*e)^(1/2))-35/16*b*n*e^2/d^4/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(
-d*e)^(1/2))+11/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^3/d^4/(e*x^2+d)^2*x^3
+13/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3/(e*x^2+d)^2*x-35/16*I*b*P
i*csgn(I*c*x^n)^3*e^2/d^4/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)+35/16*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^4/(d*e)^(1/2)*arctan(1/(d*e)^(1/2)*e*x)
+11/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^3/d^4/(e*x^2+d)^2*x^3+11/8*a*e^
3/d^4/(e*x^2+d)^2*x^3+13/8*a*e^2/d^3/(e*x^2+d)^2*x+35/8*a*e^2/d^4/(d*e)^(1/
2)*arctan(1/(d*e)^(1/2)*e*x)+1/6*I*b*Pi*csgn(I*c*x^n)^3/d^3/x^3-1/9*b*n/d^3
/x^3+35/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^4/(d*e)^(1/2)*arctan(1/(d
*e)^(1/2)*e*x)+3*b*ln(x^n)/d^4*e/x-11/16*I*b*Pi*csgn(I*c*x^n)^3*e^3/d^4/(e*
x^2+d)^2*x^3+3*b/d^4*e*n/x
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^4\,{\left(e\,x^2+d\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)^3),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.241 $\int \frac{x\log(cx^2)}{1-cx^2}\,dx$

Optimal. Leaf size=17

$$\frac{\text{Li}_2(1-cx^2)}{2c}$$

```
[Out] 1/2*polylog(2,-c*x^2+1)/c
```

Rubi [A] time = 0.04, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2336, 2315}

$$\frac{\text{PolyLog}(2,1-cx^2)}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[(x*Log[c*x^2])/(1 - c*x^2),x]
```

```
[Out] PolyLog[2, 1 - c*x^2]/(2*c)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rubi steps

$$\begin{aligned}\int \frac{x\log(cx^2)}{1-cx^2}\,dx &= \frac{1}{2}\text{Subst}\left(\int \frac{\log(cx)}{1-cx}\,dx, x, x^2\right)\\ &= \frac{\text{Li}_2(1-cx^2)}{2c}\end{aligned}$$

Mathematica [A] time = 0.00, size = 17, normalized size = 1.00

$$\frac{\text{Li}_2(1-cx^2)}{2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*Log[c*x^2])/(1 - c*x^2),x]
```

```
[Out] PolyLog[2, 1 - c*x^2]/(2*c)
```

fricas [A] time = 0.38, size = 14, normalized size = 0.82

$$\frac{\text{Li}_2(-cx^2+1)}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(c*x^2)/(-c*x^2+1),x, algorithm="fricas")
[Out] 1/2*dilog(-c*x^2 + 1)/c
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{x\log\left(cx^2\right)}{cx^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(c*x^2)/(-c*x^2+1),x, algorithm="giac")
[Out] integrate(-x*log(c*x^2)/(c*x^2 - 1), x)
```

maple [A] time = 0.03, size = 12, normalized size = 0.71

$$\frac{\operatorname{dilog}\left(c\,x^2\right)}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*ln(c*x^2)/(-c*x^2+1),x)
[Out] 1/2/c*dilog(c*x^2)
```

maxima [B] time = 0.49, size = 76, normalized size = 4.47

$$-\frac{\log\left(cx^2-1\right)\log\left(cx^2\right)}{2\,c}+\frac{\log\left(cx^2-1\right)\log(x)}{c}+\frac{\log\left(cx^2-1\right)\log\left(cx^2\right)-2\,\log\left(cx^2-1\right)\log(x)+\operatorname{Li}_2\left(-cx^2+1\right)}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(c*x^2)/(-c*x^2+1),x, algorithm="maxima")
[Out] -1/2*log(c*x^2 - 1)*log(c*x^2)/c + log(c*x^2 - 1)*log(x)/c + 1/2*(log(c*x^2
 - 1)*log(c*x^2) - 2*log(c*x^2 - 1)*log(x) + dilog(-c*x^2 + 1))/c
```

mupad [B] time = 3.38, size = 11, normalized size = 0.65

$$\frac{\operatorname{Li}_2\left(c\,x^2\right)}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(x*log(c*x^2))/(c*x^2 - 1),x)
[Out] dilog(c*x^2)/(2*c)
```

sympy [C] time = 8.25, size = 78, normalized size = 4.59

$$\frac{\begin{cases} i\pi\log\left(x\right)-\frac{\operatorname{Li}_2\left(cx^2\right)}{2} & \text{for}\ |x|<1 \\ -i\pi\log\left(\frac{1}{x}\right)-\frac{\operatorname{Li}_2\left(cx^2\right)}{2} & \text{for}\ \frac{1}{|x|}<1 \\ -i\pi G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle|x\right)+i\pi G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle|x\right)-\frac{\operatorname{Li}_2\left(cx^2\right)}{2} & \text{otherwise} \end{cases}}{c}-\frac{\log\left(cx^2\right)\log\left(cx^2-1\right)}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*ln(c*x**2)/(-c*x**2+1),x)
```

```
[Out] Piecewise((I*pi*log(x) - polylog(2, c*x**2)/2, Abs(x) < 1), (-I*pi*log(1/x)
 - polylog(2, c*x**2)/2, 1/Abs(x) < 1), (-I*pi*meijerg(((), (1, 1)), ((0, 0
), ()), x) + I*pi*meijerg(((1, 1), ()), ((), (0, 0)), x) - polylog(2, c*x**
2)/2, True))/c - log(c*x**2)*log(c*x**2 - 1)/(2*c)
```

3.242 $\int \frac{x \log\left(\frac{x^2}{c}\right)}{c-x^2} \, dx$

Optimal. Leaf size=16

$$\frac{1}{2}\text{Li}_2\left(1-\frac{x^2}{c}\right)$$

[Out] 1/2*polylog(2,1-x^2/c)

Rubi [A] time = 0.04, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2336, 2315}

$$\frac{1}{2}\text{PolyLog}\left(2,1-\frac{x^2}{c}\right)$$

Antiderivative was successfully verified.

[In] Int[(x*Log[x^2/c])/(c - x^2),x]

[Out] PolyLog[2, 1 - x^2/c]/2

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rubi steps

$$\begin{aligned}\int \frac{x \log\left(\frac{x^2}{c}\right)}{c-x^2} \, dx &= \frac{1}{2}\text{Subst}\left(\int \frac{\log\left(\frac{x}{c}\right)}{c-x} \, dx, x, x^2\right)\\ &= \frac{1}{2}\text{Li}_2\left(1-\frac{x^2}{c}\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 17, normalized size = 1.06

$$\frac{1}{2}\text{Li}_2\left(\frac{c-x^2}{c}\right)$$

Antiderivative was successfully verified.

[In] Integrate[(x*Log[x^2/c])/(c - x^2),x]

[Out] PolyLog[2, (c - x^2)/c]/2

fricas [A] time = 0.41, size = 13, normalized size = 0.81

$$\frac{1}{2}\,\text{Li}_2\left(-\frac{x^2}{c}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x^2/c)/(-x^2+c),x, algorithm="fricas")
```

```
[Out] 1/2*dilog(-x^2/c + 1)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{x \log\left(\frac{x^2}{c}\right)}{x^2 - c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x^2/c)/(-x^2+c),x, algorithm="giac")
```

```
[Out] integrate(-x*log(x^2/c)/(x^2 - c), x)
```

maple [C] time = 0.14, size = 52, normalized size = 3.25

$$\ln\left(\frac{x}{\mathrm{RootOf}\left(\_Z^2 - c\right)}\right)\ln\left(-\mathrm{RootOf}\left(\_Z^2 - c\right) + x\right) - \frac{\ln\left(\frac{x^2}{c}\right)\ln\left(-\mathrm{RootOf}\left(\_Z^2 - c\right) + x\right)}{2} + \mathrm{dilog}\left(\frac{x}{\mathrm{RootOf}\left(\_\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*ln(x^2/c)/(-x^2+c),x)
```

```
[Out] -1/2*sum(ln(x-_alpha)*ln(x^2/c)-2*dilog(x/_alpha)-2*ln(x-_alpha)*ln(x/_alph
a),_alpha=RootOf(_Z^2-c))
```

maxima [B] time = 0.48, size = 58, normalized size = 3.62

$$-\frac{1}{2}\log\left(x^2 - c\right)\log\left(\frac{x^2}{c}\right) + \frac{1}{2}\log\left(x^2 - c\right)\log\left(\frac{x^2 - c}{c} + 1\right) + \frac{1}{2}\mathrm{Li}_2\left(-\frac{x^2 - c}{c}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x^2/c)/(-x^2+c),x, algorithm="maxima")
```

```
[Out] -1/2*log(x^2 - c)*log(x^2/c) + 1/2*log(x^2 - c)*log((x^2 - c)/c + 1) + 1/2*
dilog(-(x^2 - c)/c)
```

mupad [B] time = 3.34, size = 10, normalized size = 0.62

$$\frac{\mathrm{Li}_2\left(\frac{x^2}{c}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*log(x^2/c))/(c - x^2),x)
```

```
[Out] dilog(x^2/c)/2
```

sympy [A] time = 6.18, size = 102, normalized size = 6.38

$$\begin{cases} \log(c)\log(x) + i\pi\log(x) - \frac{\mathrm{Li}_2\left(\frac{x^2}{c}\right)}{2} \\ -\log(c)\log\left(\frac{1}{x}\right) - i\pi\log\left(\frac{1}{x}\right) - \frac{\mathrm{Li}_2\left(\frac{x^2}{c}\right)}{2} \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(c) - i\pi G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right) + G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix}\middle| x\right)\log(c) + i\pi G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix}\middle| x\right) - \frac{\mathrm{Li}_2\left(\frac{x^2}{c}\right)}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*ln(x**2/c)/(-x**2+c),x)
```

```
[Out] Piecewise((log(c)*log(x) + I*pi*log(x) - polylog(2, x**2/c)/2, Abs(x) < 1),
 (-log(c)*log(1/x) - I*pi*log(1/x) - polylog(2, x**2/c)/2, 1/Abs(x) < 1), (
-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(c) - I*pi*meijerg(((), (1, 1)),
 ((0, 0), ()), x) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(c) + I*pi*me
ijerg(((1, 1), ()), ((), (0, 0)), x) - polylog(2, x**2/c)/2, True)) - log(x
**2/c)*log(-c + x**2)/2
```

3.243 $\int \frac{\log(x)}{1-x^2} \, dx$

Optimal. Leaf size=22

$$\frac{\text{Li}_2(-x)}{2}-\frac{\text{Li}_2(x)}{2}+\log(x)\tanh^{-1}(x)$$

```
[Out] arctanh(x)*ln(x)+1/2*polylog(2,-x)-1/2*polylog(2,x)
```

Rubi [A] time = 0.02, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 3, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {206, 2324, 5912}

$$\frac{1}{2}\text{PolyLog}(2,-x)-\frac{1}{2}\text{PolyLog}(2,x)+\log(x)\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[Log[x]/(1 - x^2),x]
[Out] ArcTanh[x]*Log[x] + PolyLog[2, -x]/2 - PolyLog[2, x]/2
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 5912

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x
] + (-Simp[(b*PolyLog[2, -(c*x)])/2, x] + Simp[(b*PolyLog[2, c*x])/2, x]) /
; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\log(x)}{1-x^2}\,dx &= \tanh^{-1}(x)\log(x)-\int \frac{\tanh^{-1}(x)}{x}\,dx\\ &= \tanh^{-1}(x)\log(x)+\frac{\text{Li}_2(-x)}{2}-\frac{\text{Li}_2(x)}{2}\end{aligned}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 1.41

$$\frac{\text{Li}_2(1-x)}{2}+\frac{\text{Li}_2(-x)}{2}+\frac{1}{2}\log(x)\log(x+1)$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[x]/(1 - x^2),x]
[Out] (Log[x]*Log[1 + x])/2 + PolyLog[2, 1 - x]/2 + PolyLog[2, -x]/2
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{\log(x)}{x^2-1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(-x^2+1),x, algorithm="fricas")
[Out] integral(-log(x)/(x^2 - 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{\log(x)}{x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(-x^2+1),x, algorithm="giac")
[Out] integrate(-log(x)/(x^2 - 1), x)
```

maple [A] time = 0.04, size = 20, normalized size = 0.91

$$\frac{\ln(x)\ln(x+1)}{2} + \frac{\mathrm{dilog}(x)}{2} + \frac{\mathrm{dilog}(x+1)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(x)/(-x^2+1),x)
[Out] 1/2*dilog(x)+1/2*dilog(x+1)+1/2*ln(x)*ln(x+1)
```

maxima [B] time = 0.47, size = 48, normalized size = 2.18

$$-\frac{1}{2}\log(-x)\log(x+1)+\frac{1}{2}\left(\log(x+1)-\log(x-1)\right)\log(x)+\frac{1}{2}\log(x-1)\log(x)-\frac{1}{2}\mathrm{Li}_2(x+1)+\frac{1}{2}\mathrm{Li}_2(-x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(-x^2+1),x, algorithm="maxima")
[Out] -1/2*log(-x)*log(x + 1) + 1/2*(log(x + 1) - log(x - 1))*log(x) + 1/2*log(x
- 1)*log(x) - 1/2*dilog(x + 1) + 1/2*dilog(-x + 1)
```

mupad [B] time = 0.04, size = 18, normalized size = 0.82

$$\mathrm{atanh}(x)\,\ln(x) + \frac{\mathrm{polylog}(2,-x)}{2} - \frac{\mathrm{polylog}(2,x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-log(x)/(x^2 - 1),x)
[Out] atanh(x)*log(x) + polylog(2, -x)/2 - polylog(2, x)/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{\log(x)}{x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(x)/(-x**2+1),x)
[Out] -Integral(log(x)/(x**2 - 1), x)
```

3.244 $\int \frac{\log(x)}{1+x^2} \, dx$

Optimal. Leaf size=32

$$-\frac{1}{2}i\text{Li}_2(-ix) + \frac{1}{2}i\text{Li}_2(ix) + \log(x)\tan^{-1}(x)$$

```
[Out] arctan(x)*ln(x)-1/2*I*polylog(2,-I*x)+1/2*I*polylog(2,I*x)
```

Rubi [A] time = 0.04, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {203, 2324, 4848, 2391}

$$-\frac{1}{2}i\text{PolyLog}(2,-ix) + \frac{1}{2}i\text{PolyLog}(2,ix) + \log(x)\tan^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[Log[x]/(1 + x^2),x]
```

```
[Out] ArcTan[x]*Log[x] - (I/2)*PolyLog[2, (-I)*x] + (I/2)*PolyLog[2, I*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\log(x)}{1+x^2} \, dx &= \tan^{-1}(x)\log(x) - \int \frac{\tan^{-1}(x)}{x} \, dx \\
&= \tan^{-1}(x)\log(x) - \frac{1}{2}i\int \frac{\log(1-ix)}{x} \, dx + \frac{1}{2}i\int \frac{\log(1+ix)}{x} \, dx \\
&= \tan^{-1}(x)\log(x) - \frac{1}{2}i\text{Li}_2(-ix) + \frac{1}{2}i\text{Li}_2(ix)
\end{aligned}$$

Mathematica [B] time = 0.01, size = 65, normalized size = 2.03

$$-\frac{1}{2}i\text{Li}_2(-ix) + \frac{1}{2}i\text{Li}_2(ix) - \frac{1}{2}i\log(-i(-x+i))\log(x) + \frac{1}{2}i\log(-i(x+i))\log(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[x]/(1 + x^2),x]
```

```
[Out] (-1/2*I)*Log[(-I)*(I - x)]*Log[x] + (I/2)*Log[x]*Log[(-I)*(I + x)] - (I/2)*
PolyLog[2, (-I)*x] + (I/2)*PolyLog[2, I*x]
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\log(x)}{x^2+1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(x^2+1),x, algorithm="fricas")
```

```
[Out] integral(log(x)/(x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log(x)}{x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(log(x)/(x^2 + 1), x)
```

maple [A] time = 0.04, size = 46, normalized size = 1.44

$$\frac{i\ln(x)\ln(-ix+1)}{2} - \frac{i\ln(x)\ln(ix+1)}{2} + \frac{i\,\mathrm{dilog}(-ix+1)}{2} - \frac{i\,\mathrm{dilog}(ix+1)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(x)/(x^2+1),x)
```

```
[Out] -1/2*I*ln(x)*ln(1+I*x)+1/2*I*ln(x)*ln(1-I*x)-1/2*I*dilog(1+I*x)+1/2*I*dilog
(1-I*x)
```

maxima [A] time = 1.18, size = 26, normalized size = 0.81

$$\frac{1}{4}\pi\log\left(x^2+1\right) + \frac{1}{2}i\,\mathrm{Li}_2(i\,x+1) - \frac{1}{2}i\,\mathrm{Li}_2(-i\,x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(x^2+1),x, algorithm="maxima")
```

```
[Out] 1/4*pi*log(x^2 + 1) + 1/2*I*dilog(I*x + 1) - 1/2*I*dilog(-I*x + 1)
```

mupad [B] time = 3.33, size = 24, normalized size = 0.75

$$\mathrm{atan}(x)\,\ln(x) - \frac{\mathrm{polylog}(2, -x\,1\mathrm{i})\,1\mathrm{i}}{2} + \frac{\mathrm{polylog}(2, x\,1\mathrm{i})\,1\mathrm{i}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(x)/(x^2 + 1),x)
```

```
[Out] atan(x)*log(x) - (polylog(2, -x*1i)*1i)/2 + (polylog(2, x*1i)*1i)/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log(x)}{x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(x)/(x**2+1),x)
```

```
[Out] Integral(log(x)/(x**2 + 1), x)
```

3.245 $\int \frac{a+b\log(cx)}{1-ex^2}\,dx$

Optimal. Leaf size=62

$$\frac{\tanh^{-1}\left(\sqrt{e}\,x\right)(a+b\log(cx))}{\sqrt{e}}+\frac{b\,\mathrm{Li}_2\left(-\sqrt{e}\,x\right)}{2\sqrt{e}}-\frac{b\,\mathrm{Li}_2\left(\sqrt{e}\,x\right)}{2\sqrt{e}}$$

```
[Out] arctanh(x*e^(1/2))*(a+b*ln(c*x))/e^(1/2)+1/2*b*polylog(2,-x*e^(1/2))/e^(1/2
)-1/2*b*polylog(2,x*e^(1/2))/e^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {206, 2324, 12, 5912}

$$\frac{b\,\mathrm{PolyLog}\left(2,-\sqrt{e}\,x\right)}{2\sqrt{e}}-\frac{b\,\mathrm{PolyLog}\left(2,\sqrt{e}\,x\right)}{2\sqrt{e}}+\frac{\tanh^{-1}\left(\sqrt{e}\,x\right)(a+b\log(cx))}{\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/(1 - e*x^2),x]
```

```
[Out] (ArcTanh[Sqrt[e]*x]*(a + b*Log[c*x]))/Sqrt[e] + (b*PolyLog[2, -(Sqrt[e]*x)]
)/(2*Sqrt[e]) - (b*PolyLog[2, Sqrt[e]*x])/(2*Sqrt[e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 5912

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x
] + (-Simp[(b*PolyLog[2, -(c*x)])/2, x] + Simp[(b*PolyLog[2, c*x])/2, x]) /
; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log(cx)}{1-ex^2}\,dx &= \frac{\tanh^{-1}\left(\sqrt{e}\,x\right)(a+b\log(cx))}{\sqrt{e}}-b\int \frac{\tanh^{-1}\left(\sqrt{e}\,x\right)}{\sqrt{e}\,x}\,dx\\ &= \frac{\tanh^{-1}\left(\sqrt{e}\,x\right)(a+b\log(cx))}{\sqrt{e}}-\frac{b\int \frac{\tanh^{-1}\left(\sqrt{e}\,x\right)}{x}\,dx}{\sqrt{e}}\\ &= \frac{\tanh^{-1}\left(\sqrt{e}\,x\right)(a+b\log(cx))}{\sqrt{e}}+\frac{b\,\mathrm{Li}_2\left(-\sqrt{e}\,x\right)}{2\sqrt{e}}-\frac{b\,\mathrm{Li}_2\left(\sqrt{e}\,x\right)}{2\sqrt{e}}\end{aligned}$$

Mathematica [A] time = 0.03, size = 68, normalized size = 1.10

$$\frac{-\left(\left(\log\left(1-\sqrt{e}\,x\right)-\log\left(\sqrt{e}\,x+1\right)\right)\left(a+b\log(cx)\right)\right)+b\mathrm{Li}_2\left(-\sqrt{e}\,x\right)-b\mathrm{Li}_2\left(\sqrt{e}\,x\right)}{2\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/(1 - e*x^2),x]
[Out] (-((a + b*Log[c*x])*(Log[1 - Sqrt[e]*x] - Log[1 + Sqrt[e]*x])) + b*PolyLog[
2, -(Sqrt[e]*x)] - b*PolyLog[2, Sqrt[e]*x])/(2*Sqrt[e])
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{b\log\left(cx\right)+a}{ex^2-1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(-e*x^2+1),x, algorithm="fricas")
[Out] integral(-(b*log(c*x) + a)/(e*x^2 - 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{b\log\left(cx\right)+a}{ex^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(-e*x^2+1),x, algorithm="giac")
[Out] integrate(-(b*log(c*x) + a)/(e*x^2 - 1), x)
```

maple [B] time = 0.06, size = 103, normalized size = 1.66

$$\frac{b\ln\left(cx\right)\ln\left(\frac{c\sqrt{e}\,x+c}{c}\right)}{2\sqrt{e}}-\frac{b\ln\left(cx\right)\ln\left(-\frac{c\sqrt{e}\,x-c}{c}\right)}{2\sqrt{e}}+\frac{a\,\mathrm{arctanh}\left(\sqrt{e}\,x\right)}{\sqrt{e}}+\frac{b\,\mathrm{dilog}\left(\frac{c\sqrt{e}\,x+c}{c}\right)}{2\sqrt{e}}-\frac{b\,\mathrm{dilog}\left(-\frac{c\sqrt{e}\,x-c}{c}\right)}{2\sqrt{e}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x)+a)/(-e*x^2+1),x)
[Out] a/e^(1/2)*arctanh(x*e^(1/2))-1/2*b/e^(1/2)*ln(c*x)*ln(-(x*c*e^(1/2)-c)/c)+1
/2*b/e^(1/2)*ln(c*x)*ln((x*c*e^(1/2)+c)/c)-1/2*b/e^(1/2)*dilog(-(x*c*e^(1/2
)-c)/c)+1/2*b/e^(1/2)*dilog((x*c*e^(1/2)+c)/c)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{b\log\left(cx\right)+a}{ex^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(-e*x^2+1),x, algorithm="maxima")
[Out] -integrate((b*log(c*x) + a)/(e*x^2 - 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int -\frac{a+b\,\ln\left(c\,x\right)}{e\,x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(a + b*log(c*x))/(e*x^2 - 1),x)
```

```
[Out] int(-(a + b*log(c*x))/(e*x^2 - 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{a}{ex^2 - 1}\,dx - \int \frac{b\log(cx)}{ex^2 - 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x))/(-e*x**2+1),x)
```

```
[Out] -Integral(a/(e*x**2 - 1), x) - Integral(b*log(c*x)/(e*x**2 - 1), x)
```

3.246 $\int \frac{a+b\log(cx^n)}{1-ex^2}\,dx$

Optimal. Leaf size=66

$$\frac{\tanh^{-1}\left(\sqrt{e}\,x\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{e}}+\frac{bn\text{Li}_2\left(-\sqrt{e}\,x\right)}{2\sqrt{e}}-\frac{bn\text{Li}_2\left(\sqrt{e}\,x\right)}{2\sqrt{e}}$$

```
[Out] arctanh(x*e^(1/2))*(a+b*ln(c*x^n))/e^(1/2)+1/2*b*n*polylog(2,-x*e^(1/2))/e^
(1/2)-1/2*b*n*polylog(2,x*e^(1/2))/e^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {206, 2324, 12, 5912}

$$\frac{bn\text{PolyLog}\left(2,-\sqrt{e}\,x\right)}{2\sqrt{e}}-\frac{bn\text{PolyLog}\left(2,\sqrt{e}\,x\right)}{2\sqrt{e}}+\frac{\tanh^{-1}\left(\sqrt{e}\,x\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(1 - e*x^2),x]
```

```
[Out] (ArcTanh[Sqrt[e]*x]*(a + b*Log[c*x^n]))/Sqrt[e] + (b*n*PolyLog[2, -(Sqrt[e]
*x)])/(2*Sqrt[e]) - (b*n*PolyLog[2, Sqrt[e]*x])/(2*Sqrt[e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 5912

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x
] + (-Simp[(b*PolyLog[2, -(c*x)])/2, x] + Simp[(b*PolyLog[2, c*x])/2, x]) /
; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log\left(cx^n\right)}{1-ex^2}\,dx&=\frac{\tanh^{-1}\left(\sqrt{e}\,x\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{e}}-(bn)\int \frac{\tanh^{-1}\left(\sqrt{e}\,x\right)}{\sqrt{e}\,x}\,dx\\&=\frac{\tanh^{-1}\left(\sqrt{e}\,x\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{e}}-\frac{(bn)\int \frac{\tanh^{-1}\left(\sqrt{e}\,x\right)}{x}\,dx}{\sqrt{e}}\\&=\frac{\tanh^{-1}\left(\sqrt{e}\,x\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{e}}+\frac{bn\text{Li}_2\left(-\sqrt{e}\,x\right)}{2\sqrt{e}}-\frac{bn\text{Li}_2\left(\sqrt{e}\,x\right)}{2\sqrt{e}}\end{aligned}$$

Mathematica [A] time = 0.03, size = 72, normalized size = 1.09

$$\frac{-\left(\left(\log\left(1-\sqrt{e}x\right)-\log\left(\sqrt{e}x+1\right)\right)\left(a+b\log\left(cx^{n}\right)\right)\right)+bn\text{Li}_2\left(-\sqrt{e}x\right)-bn\text{Li}_2\left(\sqrt{e}x\right)}{2\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(1 - e*x^2),x]
```

```
[Out] (-((a + b*Log[c*x^n])*(Log[1 - Sqrt[e]*x] - Log[1 + Sqrt[e]*x])) + b*n*Poly
Log[2, -(Sqrt[e]*x)] - b*n*PolyLog[2, Sqrt[e]*x])/(2*Sqrt[e])
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{b\log\left(cx^{n}\right)+a}{ex^{2}-1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(-e*x^2+1),x, algorithm="fricas")
```

```
[Out] integral(-(b*log(c*x^n) + a)/(e*x^2 - 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{b\log\left(cx^{n}\right)+a}{ex^{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(-e*x^2+1),x, algorithm="giac")
```

```
[Out] integrate(-(b*log(c*x^n) + a)/(e*x^2 - 1), x)
```

maple [C] time = 0.20, size = 200, normalized size = 3.03

$$-\frac{bn\,\text{arctanh}\left(\sqrt{e}\,x\right)\ln(x)}{\sqrt{e}}-\frac{bn\ln(x)\ln\left(-\sqrt{e}\,x+1\right)}{2\sqrt{e}}+\frac{bn\ln(x)\ln\left(\sqrt{e}\,x+1\right)}{2\sqrt{e}}-\frac{bn\,\text{dilog}\left(-\sqrt{e}\,x+1\right)}{2\sqrt{e}}+\frac{bn\,\text{dilog}\left(\sqrt{\right.}}{2\sqrt{e}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(-e*x^2+1),x)
```

```
[Out] -(-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+1/2*I*b*Pi*csgn(I*c*x^n)^3-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*
c)-b*ln(c)-a)/e^(1/2)*arctanh(e^(1/2)*x)-b/e^(1/2)*arctanh(e^(1/2)*x)*n*ln(
x)+b/e^(1/2)*arctanh(e^(1/2)*x)*ln(x^n)-1/2*b*n/e^(1/2)*ln(x)*ln(1-e^(1/2)*
x)+1/2*b*n/e^(1/2)*ln(x)*ln(e^(1/2)*x+1)-1/2*b*n/e^(1/2)*dilog(1-e^(1/2)*x)
+1/2*b*n/e^(1/2)*dilog(e^(1/2)*x+1)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-b\int \frac{\log(c)+\log\left(x^{n}\right)}{ex^{2}-1}\,dx-\frac{a\log\left(\frac{ex-\sqrt{e}}{ex+\sqrt{e}}\right)}{2\sqrt{e}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(-e*x^2+1),x, algorithm="maxima")
```

```
[Out] -b*integrate((log(c) + log(x^n))/(e*x^2 - 1), x) - 1/2*a*log((e*x - sqrt(e)
)/(e*x + sqrt(e)))/sqrt(e)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int -\frac{a+b\,\ln\left(c\,x^n\right)}{e\,x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(a + b*log(c*x^n))/(e*x^2 - 1),x)
[Out] int(-(a + b*log(c*x^n))/(e*x^2 - 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{a}{ex^2-1}\,dx-\int \frac{b\log\left(cx^n\right)}{ex^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(-e*x**2+1),x)
[Out] -Integral(a/(e*x**2 - 1), x) - Integral(b*log(c*x**n)/(e*x**2 - 1), x)
```

3.247 $\int \frac{\left(a+b\log(cx^n)\right)^2}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=509

$$\frac{bn\text{Li}_2\left(-\frac{\sqrt{e}x}{\sqrt{-d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2(-d)^{3/2}\sqrt{e}}-\frac{bn\text{Li}_2\left(\frac{\sqrt{e}x}{\sqrt{-d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2(-d)^{3/2}\sqrt{e}}+\frac{bn\log\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2(-d)^{3/2}\sqrt{e}}-\frac{bn\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}\right.}{2}$$

```
[Out] 1/2*b*n*(a+b*ln(c*x^n))*ln(1-x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)-1/4*(
a+b*ln(c*x^n))^2*ln(1-x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)-1/2*b*n*(a+b
*ln(c*x^n))*ln(1+x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)+1/4*(a+b*ln(c*x^n
))^2*ln(1+x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)-1/2*b^2*n^2*polylog(2,-x
*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)+1/2*b*n*(a+b*ln(c*x^n))*polylog(2,-
x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)+1/2*b^2*n^2*polylog(2,x*e^(1/2)/(-
d)^(1/2))/(-d)^(3/2)/e^(1/2)-1/2*b*n*(a+b*ln(c*x^n))*polylog(2,x*e^(1/2)/(-
d)^(1/2))/(-d)^(3/2)/e^(1/2)-1/2*b^2*n^2*polylog(3,-x*e^(1/2)/(-d)^(1/2))/(
-d)^(3/2)/e^(1/2)+1/2*b^2*n^2*polylog(3,x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^
(1/2)+1/4*x*(a+b*ln(c*x^n))^2/(-d)^(3/2)/((-d)^(1/2)-x*e^(1/2))+1/4*x*(a+b*
ln(c*x^n))^2/(-d)^(3/2)/((-d)^(1/2)+x*e^(1/2))
```

Rubi [A] time = 0.61, antiderivative size = 509, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {2330, 2318, 2317, 2391, 2374, 6589}

$$\frac{bn\text{PolyLog}\left(2,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2(-d)^{3/2}\sqrt{e}}-\frac{bn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2(-d)^{3/2}\sqrt{e}}-\frac{b^2n^2\text{PolyLog}\left(2,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{2(-d)^{3/2}\sqrt{e}}+\frac{b^2n^2\text{I}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(d + e*x^2)^2,x]
```

```
[Out] (x*(a + b*Log[c*x^n])^2)/(4*(-d)^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) + (x*(a + b*
Log[c*x^n])^2)/(4*(-d)^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) + (b*n*(a + b*Log[c*x^
n])*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) - ((a + b*Log[c*x
^n])^2*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - (b*n*(a + b*
Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) + ((a + b
*Log[c*x^n])^2*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - (b^2
*n^2*PolyLog[2, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e]) + (b*n*(a
+ b*Log[c*x^n])*PolyLog[2, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e])
 + (b^2*n^2*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) - (b*n
*(a + b*Log[c*x^n])*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]
) - (b^2*n^2*PolyLog[3, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e]) +
(b^2*n^2*PolyLog[3, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e])
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex^2\right)^2}\,dx=\int\left(-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2d\left(-de-e^2x^2\right)}\right)dx$$

$$=-\frac{e\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx}{4d}-\frac{e\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}\,dx}{4d}-\frac{e\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{-de-e^2x^2}\,dx}{2d}$$

$$=\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{e\int\left(-\frac{\sqrt{-d}\left(a+b\log\left(cx^n\right)\right)^2}{2de\left(\sqrt{-d}-\sqrt{e}x\right)}-\frac{\sqrt{-d}\,(a}{2de(\sqrt{}}\right.}{2d}$$

$$=\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bn\left(a+b\log\left(cx^n\right)\right)\log\left(1-\frac{\sqrt{}}{\sqrt{}}\right.}{2(-d)^{3/2}\sqrt{e}}$$

$$=\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bn\left(a+b\log\left(cx^n\right)\right)\log\left(1-\frac{\sqrt{}}{\sqrt{}}\right.}{2(-d)^{3/2}\sqrt{e}}$$

$$=\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bn\left(a+b\log\left(cx^n\right)\right)\log\left(1-\frac{\sqrt{}}{\sqrt{}}\right.}{2(-d)^{3/2}\sqrt{e}}$$

$$=\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bn\left(a+b\log\left(cx^n\right)\right)\log\left(1-\frac{\sqrt{}}{\sqrt{}}\right.}{2(-d)^{3/2}\sqrt{e}}$$

Mathematica [A] time = 0.78, size = 432, normalized size = 0.85

$$-\frac{\frac{2bn\text{Li}_2\left(\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a+b\log(cx^n))}{(-d)^{3/2}}+\frac{2bn\text{Li}_2\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)(a+b\log(cx^n))}{(-d)^{3/2}}-\frac{2bn\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n))}{(-d)^{3/2}}+\frac{2bn\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)(a+b\log(cx^n))}{(-d)^{3/2}}-\frac{(a+b}{d(\sqrt{}}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(d + e*x^2)^2,x]
```

```
[Out] (-((a + b*Log[c*x^n])^2/(d*(Sqrt[-d] - Sqrt[e]*x))) + (a + b*Log[c*x^n])^2/
(d*(Sqrt[-d] + Sqrt[e]*x)) - (2*b*n*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/
Sqrt[-d]])/(-d)^(3/2) + ((a + b*Log[c*x^n])^2*Log[1 + (Sqrt[e]*x)/Sqrt[-d]]
)/(-d)^(3/2) + (2*b*n*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])
/(-d)^(3/2) + (d*(a + b*Log[c*x^n])^2*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-
d)^(5/2) + (2*b^2*n^2*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(3/2) - (2*b*n
*(a + b*Log[c*x^n])*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(3/2) - (2*b^2*n
^2*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(3/2) + (2*b*n*(a + b*Log[c*x
^n])*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(3/2) + (2*b^2*n^2*PolyLog[
3, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(3/2) - (2*b^2*n^2*PolyLog[3, (d*Sqrt[e]*x)/
(-d)^(3/2)])/(-d)^(3/2))/(4*Sqrt[e])
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\log(cx^n)^2+2\,ab\log(cx^n)+a^2}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^4 + 2*d*e*x^2 +
 d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{(b\log(cx^n)+a)^2}{(ex^2+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/(e*x^2 + d)^2, x)
```

maple [F] time = 27.05, size = 0, normalized size = 0.00

$$\int\frac{(b\ln(c\,x^n)+a)^2}{(e\,x^2+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/(e*x^2+d)^2,x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/(e*x^2+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}a^2\left(\frac{x}{dex^2+d^2}+\frac{\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d}\right)+\int\frac{b^2\log(c)^2+b^2\log(x^n)^2+2\,ab\log(c)+2\left(b^2\log(c)+ab\right)\log(x^n)}{e^2x^4+2\,dex^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*(x/(d*e*x^2 + d^2) + arctan(e*x/sqrt(d*e))/(sqrt(d*e)*d)) + integra
te((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log
(x^n))/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\ln(c\,x^n))^2}{\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(d + e*x^2)^2,x)
```

```
[Out] int((a + b*log(c*x^n))^2/(d + e*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(d + e*x**2)**2, x)
```

3.248 $\int \frac{\left(a+b\log(cx^n)\right)^3}{\left(d+ex^2\right)^2} dx$

Optimal. Leaf size=711

$$-\frac{3b^2n^2\text{Li}_2\left(-\frac{\sqrt{e}x}{\sqrt{-d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2(-d)^{3/2}\sqrt{e}}+\frac{3b^2n^2\text{Li}_2\left(\frac{\sqrt{e}x}{\sqrt{-d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2(-d)^{3/2}\sqrt{e}}-\frac{3b^2n^2\text{Li}_3\left(-\frac{\sqrt{e}x}{\sqrt{-d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2(-d)^{3/2}\sqrt{e}}+\frac{3b^2}{}$$

```
[Out] 3/4*b*n*(a+b*ln(c*x^n))^2*ln(1-x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)-1/4
*(a+b*ln(c*x^n))^3*ln(1-x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)-3/4*b*n*(a
+b*ln(c*x^n))^2*ln(1+x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)+1/4*(a+b*ln(c
*x^n))^3*ln(1+x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)-3/2*b^2*n^2*(a+b*ln(
c*x^n))*polylog(2,-x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)+3/4*b*n*(a+b*ln
(c*x^n))^2*polylog(2,-x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)+3/2*b^2*n^2*
(a+b*ln(c*x^n))*polylog(2,x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)-3/4*b*n*
(a+b*ln(c*x^n))^2*polylog(2,x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)+3/2*b^
3*n^3*polylog(3,-x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)-3/2*b^2*n^2*(a+b*
ln(c*x^n))*polylog(3,-x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)-3/2*b^3*n^3*
polylog(3,x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)+3/2*b^2*n^2*(a+b*ln(c*x^
n))*polylog(3,x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)+3/2*b^3*n^3*polylog(
4,-x*e^(1/2)/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)-3/2*b^3*n^3*polylog(4,x*e^(1/2)
/(-d)^(1/2))/(-d)^(3/2)/e^(1/2)+1/4*x*(a+b*ln(c*x^n))^3/(-d)^(3/2)/((-d)^(1
/2)-x*e^(1/2))+1/4*x*(a+b*ln(c*x^n))^3/(-d)^(3/2)/((-d)^(1/2)+x*e^(1/2))
```

Rubi [A] time = 0.85, antiderivative size = 711, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {2330, 2318, 2317, 2374, 6589, 2383}

$$-\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2(-d)^{3/2}\sqrt{e}}+\frac{3b^2n^2\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2(-d)^{3/2}\sqrt{e}}-\frac{3b^2n^2\text{PolyLog}\left(3,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{2(-d)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^3/(d + e*x^2)^2,x]
```

```
[Out] (x*(a + b*Log[c*x^n])^3)/(4*(-d)^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) + (x*(a + b*
Log[c*x^n])^3)/(4*(-d)^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) + (3*b*n*(a + b*Log[c*
x^n])^2*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - ((a + b*Log
[c*x^n])^3*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - (3*b*n*(
a + b*Log[c*x^n])^2*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) +
 ((a + b*Log[c*x^n])^3*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]
) - (3*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(
-d)^(3/2)*Sqrt[e]) + (3*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((Sqrt[e]*x)/S
qrt[-d])])/(4*(-d)^(3/2)*Sqrt[e]) + (3*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2
, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) - (3*b*n*(a + b*Log[c*x^n])
^2*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) + (3*b^3*n^3*Po
lyLog[3, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e]) - (3*b^2*n^2*(a +
 b*Log[c*x^n])*PolyLog[3, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e])
 - (3*b^3*n^3*PolyLog[3, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) + (3*
b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*
Sqrt[e]) + (3*b^3*n^3*PolyLog[4, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sq
rt[e]) - (3*b^3*n^3*PolyLog[4, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]
)
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
```

```
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2383

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^p)/q
, x] - Dist[(b*n*p)/q, Int[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^(p - 1
))/x, x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^3}{\left(d+ex^2\right)^2}\,dx = \int \left(-\frac{e\left(a+b\log\left(cx^n\right)\right)^3}{4d\left(\sqrt{-d}\,\sqrt{e}\,-ex\right)^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^3}{4d\left(\sqrt{-d}\,\sqrt{e}\,+ex\right)^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^3}{2d\left(-de-e^2x^2\right)}\right)dx$$

$$= -\frac{e\int \frac{\left(a+b\log(cx^n)\right)^3}{\left(\sqrt{-d}\,\sqrt{e}-ex\right)^2}dx}{4d}-\frac{e\int \frac{\left(a+b\log(cx^n)\right)^3}{\left(\sqrt{-d}\,\sqrt{e}+ex\right)^2}dx}{4d}-\frac{e\int \frac{\left(a+b\log(cx^n)\right)^3}{-de-e^2x^2}dx}{2d}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,-\sqrt{e}\,x\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,+\sqrt{e}\,x\right)}-\frac{e\int\left(-\frac{\sqrt{-d}\left(a+b\log(cx^n)\right)^3}{2de\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{-d}\left(a+b\log\right.}{2de\left(\sqrt{-d}\right.}\right.}{2d}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,-\sqrt{e}\,x\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,+\sqrt{e}\,x\right)}+\frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\log\left(1-\frac{\sqrt{e}}{\sqrt{-}}\right.}{4(-d)^{3/2}\sqrt{e}}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,-\sqrt{e}\,x\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,+\sqrt{e}\,x\right)}+\frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\log\left(1-\frac{\sqrt{e}}{\sqrt{-}}\right.}{4(-d)^{3/2}\sqrt{e}}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,-\sqrt{e}\,x\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,+\sqrt{e}\,x\right)}+\frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\log\left(1-\frac{\sqrt{e}}{\sqrt{-}}\right.}{4(-d)^{3/2}\sqrt{e}}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,-\sqrt{e}\,x\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,+\sqrt{e}\,x\right)}+\frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\log\left(1-\frac{\sqrt{e}}{\sqrt{-}}\right.}{4(-d)^{3/2}\sqrt{e}}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,-\sqrt{e}\,x\right)}+\frac{x\left(a+b\log\left(cx^n\right)\right)^3}{4(-d)^{3/2}\left(\sqrt{-d}\,+\sqrt{e}\,x\right)}+\frac{3bn\left(a+b\log\left(cx^n\right)\right)^2\log\left(1-\frac{\sqrt{e}}{\sqrt{-}}\right.}{4(-d)^{3/2}\sqrt{e}}$$

Mathematica [C] time = 2.46, size = 1073, normalized size = 1.51

$$\frac{ib^3\left(\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)\log^3(x)-\log\left(\frac{i\sqrt{e}x}{\sqrt{d}}+1\right)\log^3(x)+\frac{\sqrt{d}\log^3(x)}{i\sqrt{e}x+\sqrt{d}}+\frac{\sqrt{e}x\log^3(x)}{\sqrt{e}x+i\sqrt{d}}-\log^3(x)-3\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)\log^2(x)+3\log\left(\frac{i\sqrt{e}x}{\sqrt{d}}+1\right)\log^2(x)-3(\log(x)-2)\mathrm{Li}_2\left(-\frac{i}{}\right.\right.}{\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^3/(d + e*x^2)^2,x]
```

```
[Out] ((2*Sqrt[d]*x*(a - b*n*Log[x] + b*Log[c*x^n])^3)/(d + e*x^2) + (2*ArcTan[(S
qrt[e]*x)/Sqrt[d]]*(a - b*n*Log[x] + b*Log[c*x^n])^3)/Sqrt[e] + 3*b*n*(a -
b*n*Log[x] + b*Log[c*x^n])^2*((Sqrt[e]*x*Log[x] + I*(Sqrt[d] + I*Sqrt[e]*x)
*Log[I*Sqrt[d] - Sqrt[e]*x])/(Sqrt[d]*Sqrt[e] + I*e*x) + (Sqrt[e]*x*Log[x]
+ ((-I)*Sqrt[d] - Sqrt[e]*x)*Log[I*Sqrt[d] + Sqrt[e]*x])/(Sqrt[d]*Sqrt[e] -
 I*e*x) - (I*(Log[x]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + PolyLog[2, ((-I)*Sqrt
[e]*x)/Sqrt[d]]))/Sqrt[e] + (I*(Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + Pol
yLog[2, (I*Sqrt[e]*x)/Sqrt[d]]))/Sqrt[e]) + 3*b^2*n^2*(a - b*n*Log[x] + b*L
og[c*x^n])*((Log[x]*(Sqrt[e]*x*Log[x] + (2*I)*(Sqrt[d] + I*Sqrt[e]*x)*Log[1
 + (I*Sqrt[e]*x)/Sqrt[d]]) + (2*I)*(Sqrt[d] + I*Sqrt[e]*x)*PolyLog[2, ((-I)
*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*Sqrt[e] + I*e*x) + (Log[x]*(Sqrt[e]*x*Log[x]
 - (2*I)*(Sqrt[d] - I*Sqrt[e]*x)*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]]) - 2*(I*Sqr
t[d] + Sqrt[e]*x)*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*Sqrt[e] - I*e
*x) - (I*(Log[x]^2*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + 2*Log[x]*PolyLog[2, ((-
I)*Sqrt[e]*x)/Sqrt[d]] - 2*PolyLog[3, ((-I)*Sqrt[e]*x)/Sqrt[d]]))/Sqrt[e] +
```

```
(I*(Log[x]^2*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 2*Log[x]*PolyLog[2, (I*Sqrt[
e]*x)/Sqrt[d]] - 2*PolyLog[3, (I*Sqrt[e]*x)/Sqrt[d]]))/Sqrt[e]) + (I*b^3*n^
3*(-Log[x]^3 + (Sqrt[d]*Log[x]^3)/(Sqrt[d] + I*Sqrt[e]*x) + (Sqrt[e]*x*Log[
x]^3)/(I*Sqrt[d] + Sqrt[e]*x) - 3*Log[x]^2*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] +
 Log[x]^3*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 3*Log[x]^2*Log[1 + (I*Sqrt[e]*x)
/Sqrt[d]] - Log[x]^3*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] - 3*(-2 + Log[x])*Log[x
]*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 3*(-2 + Log[x])*Log[x]*PolyLog[2,
(I*Sqrt[e]*x)/Sqrt[d]] - 6*PolyLog[3, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 6*Log[x]*
PolyLog[3, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 6*PolyLog[3, (I*Sqrt[e]*x)/Sqrt[d]]
- 6*Log[x]*PolyLog[3, (I*Sqrt[e]*x)/Sqrt[d]] - 6*PolyLog[4, ((-I)*Sqrt[e]*x
)/Sqrt[d]] + 6*PolyLog[4, (I*Sqrt[e]*x)/Sqrt[d]]))/Sqrt[e])/(4*d^(3/2))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^3\log\left(cx^n\right)^3+3\,ab^2\log\left(cx^n\right)^2+3\,a^2b\log\left(cx^n\right)+a^3}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^3*log(c*x^n)^3 + 3*a*b^2*log(c*x^n)^2 + 3*a^2*b*log(c*x^n) + a^
3)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^3}{\left(ex^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^3/(e*x^2 + d)^2, x)
```

maple [F] time = 31.29, size = 0, normalized size = 0.00

$$\int\frac{\left(b\ln\left(c\,x^n\right)+a\right)^3}{\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^3/(e*x^2+d)^2,x)
```

```
[Out] int((b*ln(c*x^n)+a)^3/(e*x^2+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a^3\left(\frac{x}{dex^2+d^2}+\frac{\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d}\right)+\int\frac{b^3\log(c)^3+b^3\log\left(x^n\right)^3+3\,ab^2\log(c)^2+3\,a^2b\log(c)+3\left(b^3\log(c)+a\right.}{e^2x^4+2\,dex^2+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a^3*(x/(d*e*x^2 + d^2) + arctan(e*x/sqrt(d*e))/(sqrt(d*e)*d)) + integra
te((b^3*log(c)^3 + b^3*log(x^n)^3 + 3*a*b^2*log(c)^2 + 3*a^2*b*log(c) + 3*(
b^3*log(c) + a*b^2)*log(x^n)^2 + 3*(b^3*log(c)^2 + 2*a*b^2*log(c) + a^2*b)*
log(x^n))/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\ln(c\,x^n))^3}{\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^3/(d + e*x^2)^2,x)
```

```
[Out] int((a + b*log(c*x^n))^3/(d + e*x^2)^2, x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^3}{\left(d+ex^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**3/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**3/(d + e*x**2)**2, x)
```

3.249 $\int \frac{1}{(d+ex^2)^2(a+b\log(cx^n))}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)},x\right)$$

[Out] Unintegrable(1/(e*x^2+d)^2/(a+b*ln(c*x^n)),x)

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

[In] Int[1/((d + e*x^2)^2*(a + b*Log[c*x^n])),x]

[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*Log[c*x^n])), x]

Rubi steps

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)}\,dx=\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Mathematica [A] time = 2.88, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[1/((d + e*x^2)^2*(a + b*Log[c*x^n])),x]

[Out] Integrate[1/((d + e*x^2)^2*(a + b*Log[c*x^n])), x]

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{ae^2x^4+2\,adex^2+ad^2+\left(be^2x^4+2\,bdex^2+bd^2\right)\log\left(cx^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n)),x, algorithm="fricas")

[Out] integral(1/(a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^2)*log(c*x^n)), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(ex^2+d\right)^2\left(b\log\left(cx^n\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n)),x, algorithm="giac")
[Out] integrate(1/((e*x^2 + d)^2*(b*log(c*x^n) + a)), x)
```

maple [A] time = 0.58, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\,x^{2}+d\right)^{2}\left(b\ln\left(c\,x^{n}\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^2/(b*ln(c*x^n)+a),x)
[Out] int(1/(e*x^2+d)^2/(b*ln(c*x^n)+a),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(ex^{2}+d\right)^{2}\left(b\log\left(cx^{n}\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n)),x, algorithm="maxima")
[Out] integrate(1/((e*x^2 + d)^2*(b*log(c*x^n) + a)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\left(e\,x^{2}+d\right)^{2}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d + e*x^2)^2*(a + b*log(c*x^n))),x)
[Out] int(1/((d + e*x^2)^2*(a + b*log(c*x^n))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+b\log\left(cx^{n}\right)\right)\left(d+ex^{2}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**2/(a+b*ln(c*x**n)),x)
[Out] Integral(1/((a + b*log(c*x**n))*(d + e*x**2)**2), x)
```

3.250 $\int \frac{1}{(d+ex^2)^2(a+b\log(cx^n))^2}\,dx$

Optimal. Leaf size=25

$$\mathrm{Int}\left(\frac{1}{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)^2},x\right)$$

[Out] Unintegrable(1/(e*x^2+d)^2/(a+b*ln(c*x^n))^2,x)

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[1/((d + e*x^2)^2*(a + b*Log[c*x^n])^2),x]

[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*Log[c*x^n])^2), x]

Rubi steps

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)^2}\,dx=\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)^2}\,dx$$

Mathematica [A] time = 14.49, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[1/((d + e*x^2)^2*(a + b*Log[c*x^n])^2),x]

[Out] Integrate[1/((d + e*x^2)^2*(a + b*Log[c*x^n])^2), x]

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{a^2e^2x^4+2\,a^2dex^2+a^2d^2+\left(b^2e^2x^4+2\,b^2dex^2+b^2d^2\right)\log\left(cx^n\right)^2+2\left(abe^2x^4+2\,abdex^2+abd^2\right)\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n))^2,x, algorithm="fricas")

[Out] integral(1/(a^2*e^2*x^4 + 2*a^2*d*e*x^2 + a^2*d^2 + (b^2*e^2*x^4 + 2*b^2*d*e*x^2 + b^2*d^2)*log(c*x^n)^2 + 2*(a*b*e^2*x^4 + 2*a*b*d*e*x^2 + a*b*d^2)*log(c*x^n)), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(ex^2+d\right)^2\left(b\log\left(cx^n\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)^2*(b*log(c*x^n) + a)^2), x)
```

maple [A] time = 3.52, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\,x^{2}+d\right)^{2} \left(b \ln \left(c\,x^{n}\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^2/(b*ln(c*x^n)+a)^2,x)
```

```
[Out] int(1/(e*x^2+d)^2/(b*ln(c*x^n)+a)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{x}{b^{2}d^{2}n\log(c)+abd^{2}n+\left(b^{2}e^{2}n\log(c)+abe^{2}n\right)x^{4}+2\left(b^{2}den\log(c)+abden\right)x^{2}+\left(b^{2}e^{2}nx^{4}+2\,b^{2}denx^{2}+b^{2}d^{2}n\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] -x/(b^2*d^2*n*log(c) + a*b*d^2*n + (b^2*e^2*n*log(c) + a*b*e^2*n)*x^4 + 2*(
b^2*d*e*n*log(c) + a*b*d*e*n)*x^2 + (b^2*e^2*n*x^4 + 2*b^2*d*e*n*x^2 + b^2*
d^2*n)*log(x^n)) - integrate((3*e*x^2 - d)/((b^2*e^3*n*log(c) + a*b*e^3*n)*
x^6 + b^2*d^3*n*log(c) + a*b*d^3*n + 3*(b^2*d*e^2*n*log(c) + a*b*d*e^2*n)*x
^4 + 3*(b^2*d^2*e*n*log(c) + a*b*d^2*e*n)*x^2 + (b^2*e^3*n*x^6 + 3*b^2*d*e^
2*n*x^4 + 3*b^2*d^2*e*n*x^2 + b^2*d^3*n)*log(x^n)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{{\left(e\,x^2+d\right)}^2\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d + e*x^2)^2*(a + b*log(c*x^n))^2),x)
```

```
[Out] int(1/((d + e*x^2)^2*(a + b*log(c*x^n))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**2+d)**2/(a+b*ln(c*x**n))**2,x)
```

```
[Out] Timed out
```

3.251 $\int x^5\sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=208

$$\frac{d^2(d+ex^2)^{3/2}(a+b\log(cx^n))}{3e^3}-\frac{2d(d+ex^2)^{5/2}(a+b\log(cx^n))}{5e^3}+\frac{(d+ex^2)^{7/2}(a+b\log(cx^n))}{7e^3}+\frac{8bd^{7/2}n\tanh}{10}$$

```
[Out] -8/315*b*d^2*n*(e*x^2+d)^(3/2)/e^3+9/175*b*d*n*(e*x^2+d)^(5/2)/e^3-1/49*b*n
*(e*x^2+d)^(7/2)/e^3+8/105*b*d^(7/2)*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/e^3
+1/3*d^2*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/e^3-2/5*d*(e*x^2+d)^(5/2)*(a+b*ln(
c*x^n))/e^3+1/7*(e*x^2+d)^(7/2)*(a+b*ln(c*x^n))/e^3-8/105*b*d^3*n*(e*x^2+d)
^(1/2)/e^3
```

Rubi [A] time = 0.25, antiderivative size = 208, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {266, 43, 2350, 12, 1251, 897, 1261, 208}

$$\frac{d^2(d+ex^2)^{3/2}(a+b\log(cx^n))}{3e^3}-\frac{2d(d+ex^2)^{5/2}(a+b\log(cx^n))}{5e^3}+\frac{(d+ex^2)^{7/2}(a+b\log(cx^n))}{7e^3}-\frac{8bd^3n\sqrt{d+}}{105e^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-8*b*d^3*n*Sqrt[d + e*x^2])/(105*e^3) - (8*b*d^2*n*(d + e*x^2)^(3/2))/(315
*e^3) + (9*b*d*n*(d + e*x^2)^(5/2))/(175*e^3) - (b*n*(d + e*x^2)^(7/2))/(49
*e^3) + (8*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(105*e^3) + (d^2*(
d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) - (2*d*(d + e*x^2)^(5/2)*(a +
b*Log[c*x^n]))/(5*e^3) + ((d + e*x^2)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
```

```
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int x^5\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)dx = \frac{d^2\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} - \frac{2d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} + \frac{\left(d+e\right.}{}$$

$$= \frac{d^2\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} - \frac{2d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} + \frac{\left(d+e\right.}{}$$

$$= \frac{d^2\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} - \frac{2d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} + \frac{\left(d+e\right.}{}$$

$$= \frac{d^2\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} - \frac{2d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} + \frac{\left(d+e\right.}{}$$

$$= \frac{d^2\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} - \frac{2d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} + \frac{\left(d+e\right.}{}$$

$$= -\frac{8bd^3n\sqrt{d+ex^2}}{105e^3} - \frac{8bd^2n\left(d+ex^2\right)^{3/2}}{315e^3} + \frac{9bdn\left(d+ex^2\right)^{5/2}}{175e^3} - \frac{bn\left(d+ex^2\right)^{7}}{49e^3}$$

$$= -\frac{8bd^3n\sqrt{d+ex^2}}{105e^3} - \frac{8bd^2n\left(d+ex^2\right)^{3/2}}{315e^3} + \frac{9bdn\left(d+ex^2\right)^{5/2}}{175e^3} - \frac{bn\left(d+ex^2\right)^{7}}{49e^3}$$

Mathematica [A] time = 0.20, size = 251, normalized size = 1.21

$$\sqrt{d+ex^2}\left(\frac{2d^3\left(420a+420b\left(\log\left(cx^n\right)-n\log(x)\right)-389bn\right)}{11025e^3}-\frac{d^2x^2\left(420a+420b\left(\log\left(cx^n\right)-n\log(x)\right)-17\right.}{11025e^2}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-8*b*d^(7/2)*n*Log[x])/(105*e^3) + (b*n*Sqrt[d + e*x^2]*(8*d^3 - 4*d^2*e*x
^2 + 3*d*e^2*x^4 + 15*e^3*x^6)*Log[x])/(105*e^3) + Sqrt[d + e*x^2]*((x^6*(7
*a - b*n + 7*b*(-(n*Log[x]) + Log[c*x^n])))/49 + (d*x^4*(35*a - 12*b*n + 35
*b*(-(n*Log[x]) + Log[c*x^n])))/(1225*e) + (2*d^3*(420*a - 389*b*n + 420*b*
(-(n*Log[x]) + Log[c*x^n])))/(11025*e^3) - (d^2*x^2*(420*a - 179*b*n + 420*
b*(-(n*Log[x]) + Log[c*x^n])))/(11025*e^2)) + (8*b*d^(7/2)*n*Log[d + Sqrt[d
]*Sqrt[d + e*x^2]])/(105*e^3)
```

fricas [A] time = 0.52, size = 414, normalized size = 1.99

$$\left[\frac{420\,bd^{\frac{7}{2}}n\log\left(-\frac{ex^2+2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right)-\left(225\left(be^3n-7\,ae^3\right)x^6+778\,bd^3n+9\left(12\,bde^2n-35\,ade^2\right)x^4-840\,ad^3\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/11025*(420*b*d^(7/2)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^
2) - (225*(b*e^3*n - 7*a*e^3)*x^6 + 778*b*d^3*n + 9*(12*b*d*e^2*n - 35*a*d*
e^2)*x^4 - 840*a*d^3 - (179*b*d^2*e*n - 420*a*d^2*e)*x^2 - 105*(15*b*e^3*x^
6 + 3*b*d*e^2*x^4 - 4*b*d^2*e*x^2 + 8*b*d^3)*log(c) - 105*(15*b*e^3*n*x^6 +
 3*b*d*e^2*n*x^4 - 4*b*d^2*e*n*x^2 + 8*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/e^
3, -1/11025*(840*b*sqrt(-d)*d^3*n*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (225*(
b*e^3*n - 7*a*e^3)*x^6 + 778*b*d^3*n + 9*(12*b*d*e^2*n - 35*a*d*e^2)*x^4 -
840*a*d^3 - (179*b*d^2*e*n - 420*a*d^2*e)*x^2 - 105*(15*b*e^3*x^6 + 3*b*d*e
^2*x^4 - 4*b*d^2*e*x^2 + 8*b*d^3)*log(c) - 105*(15*b*e^3*n*x^6 + 3*b*d*e^2*
n*x^4 - 4*b*d^2*e*n*x^2 + 8*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/e^3]
```

giac [A] time = 0.75, size = 296, normalized size = 1.42

$$\frac{1}{7}\sqrt{x^2e+d}\,bx^6\log(c)+\frac{1}{35}\sqrt{x^2e+d}\,bdx^4e^{(-1)}\log(c)+\frac{1}{7}\sqrt{x^2e+d}\,ax^6+\frac{1}{35}\sqrt{x^2e+d}\,adx^4e^{(-1)}-\frac{4}{105}\sqrt{x^2e+d}\,bd$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] 1/7*sqrt(x^2*e + d)*b*x^6*log(c) + 1/35*sqrt(x^2*e + d)*b*d*x^4*e^(-1)*log(
c) + 1/7*sqrt(x^2*e + d)*a*x^6 + 1/35*sqrt(x^2*e + d)*a*d*x^4*e^(-1) - 4/10
5*sqrt(x^2*e + d)*b*d^2*x^2*e^(-2)*log(c) - 4/105*sqrt(x^2*e + d)*a*d^2*x^2
*e^(-2) + 8/105*sqrt(x^2*e + d)*b*d^3*e^(-3)*log(c) + 8/105*sqrt(x^2*e + d)
*a*d^3*e^(-3) + 1/11025*(105*(15*(x^2*e + d)^(7/2) - 42*(x^2*e + d)^(5/2)*d
 + 35*(x^2*e + d)^(3/2)*d^2)*e^(-3)*log(x) - (840*d^4*arctan(sqrt(x^2*e + d
)/sqrt(-d))/sqrt(-d) + 225*(x^2*e + d)^(7/2) - 567*(x^2*e + d)^(5/2)*d + 28
0*(x^2*e + d)^(3/2)*d^2 + 840*sqrt(x^2*e + d)*d^3)*e^(-3))*b*n
```

maple [F] time = 0.42, size = 0, normalized size = 0.00

$$\int\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{e\,x^2+d}\;x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
[Out] int(x^5*(b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
```

maxima [A] time = 1.03, size = 220, normalized size = 1.06

$$-\frac{1}{11025}\left(\frac{420\,d^{\frac{7}{2}}\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{e^3}+\frac{225\left(ex^2+d\right)^{\frac{7}{2}}-567\left(ex^2+d\right)^{\frac{5}{2}}d+280\left(ex^2+d\right)^{\frac{3}{2}}d^2+840\sqrt{ex^2+d}\,d^3}{e^3}\right)bn$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
[Out] -1/11025*(420*d^(7/2)*log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + sq
rt(d)))/e^3 + (225*(e*x^2 + d)^(7/2) - 567*(e*x^2 + d)^(5/2)*d + 280*(e*x^2
 + d)^(3/2)*d^2 + 840*sqrt(e*x^2 + d)*d^3)/e^3)*b*n + 1/105*(15*(e*x^2 + d)
^(3/2)*x^4/e - 12*(e*x^2 + d)^(3/2)*d*x^2/e^2 + 8*(e*x^2 + d)^(3/2)*d^2/e^3
)*b*log(c*x^n) + 1/105*(15*(e*x^2 + d)^(3/2)*x^4/e - 12*(e*x^2 + d)^(3/2)*d
*x^2/e^2 + 8*(e*x^2 + d)^(3/2)*d^2/e^3)*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^5\,\sqrt{e\,x^2+d}\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d + e*x^2)^(1/2)*(a + b*log(c*x^n)),x)
[Out] int(x^5*(d + e*x^2)^(1/2)*(a + b*log(c*x^n)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^5\left(a+b\log\left(cx^n\right)\right)\sqrt{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
[Out] Integral(x**5*(a + b*log(c*x**n))*sqrt(d + e*x**2), x)
```

3.252 $\int x^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=154

$$-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}-\frac{2bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{15e^2}+\frac{2bd^2n\sqrt{d+ex^2}}{15e^2}+\cdots$$

```
[Out] 2/45*b*d*n*(e*x^2+d)^(3/2)/e^2-1/25*b*n*(e*x^2+d)^(5/2)/e^2-2/15*b*d^(5/2)*
n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/e^2-1/3*d*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n)
)/e^2+1/5*(e*x^2+d)^(5/2)*(a+b*ln(c*x^n))/e^2+2/15*b*d^2*n*(e*x^2+d)^(1/2)/
e^2
```

Rubi [A] time = 0.18, antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 43, 2350, 12, 446, 80, 50, 63, 208}

$$-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}+\frac{2bd^2n\sqrt{d+ex^2}}{15e^2}-\frac{2bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{15e^2}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*b*d^2*n*Sqrt[d + e*x^2])/(15*e^2) + (2*b*d*n*(d + e*x^2)^(3/2))/(45*e^2)
 - (b*n*(d + e*x^2)^(5/2))/(25*e^2) - (2*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^2
]/Sqrt[d]])/(15*e^2) - (d*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2) + (
(d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int x^3\sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx = -\frac{d(d+ex^2)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{(d+ex^2)^{5/2}(a+b\log(cx^n))}{5e^2}-(bn)$$

$$= -\frac{d(d+ex^2)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{(d+ex^2)^{5/2}(a+b\log(cx^n))}{5e^2}-\frac{(bn)}{}$$

$$= -\frac{d(d+ex^2)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{(d+ex^2)^{5/2}(a+b\log(cx^n))}{5e^2}-\frac{(bn)}{}$$

$$= -\frac{bn(d+ex^2)^{5/2}}{25e^2}-\frac{d(d+ex^2)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{(d+ex^2)^{5/2}(a+b}{5e^2}$$

$$= \frac{2bdn(d+ex^2)^{3/2}}{45e^2}-\frac{bn(d+ex^2)^{5/2}}{25e^2}-\frac{d(d+ex^2)^{3/2}(a+b\log(cx^n))}{3e^2}+$$

$$= \frac{2bd^2n\sqrt{d+ex^2}}{15e^2}+\frac{2bdn(d+ex^2)^{3/2}}{45e^2}-\frac{bn(d+ex^2)^{5/2}}{25e^2}-\frac{d(d+ex^2)^{3/2}(}{3}$$

$$= \frac{2bd^2n\sqrt{d+ex^2}}{15e^2}+\frac{2bdn(d+ex^2)^{3/2}}{45e^2}-\frac{bn(d+ex^2)^{5/2}}{25e^2}-\frac{d(d+ex^2)^{3/2}(}{3}$$

$$= \frac{2bd^2n\sqrt{d+ex^2}}{15e^2}+\frac{2bdn(d+ex^2)^{3/2}}{45e^2}-\frac{bn(d+ex^2)^{5/2}}{25e^2}-\frac{2bd^{5/2}n\tanh^{-1}}{15e^2}$$

Mathematica [A] time = 0.16, size = 204, normalized size = 1.32

$$\sqrt{d+ex^2}\left(-\frac{d^2(30a+30b(\log(cx^n)-n\log(x))-31bn)}{225e^2}+\frac{dx^2(15a+15b(\log(cx^n)-n\log(x))-8bn)}{225e}+\frac{1}{25}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*b*d^(5/2)*n*Log[x])/(15*e^2) - (b*n*Sqrt[d + e*x^2]*(2*d^2 - d*e*x^2 - 3
*e^2*x^4)*Log[x])/(15*e^2) + Sqrt[d + e*x^2]*((x^4*(5*a - b*n + 5*b*(-(n*Lo
g[x]) + Log[c*x^n])))/25 + (d*x^2*(15*a - 8*b*n + 15*b*(-(n*Log[x]) + Log[c
*x^n])))/(225*e) - (d^2*(30*a - 31*b*n + 30*b*(-(n*Log[x]) + Log[c*x^n])))/
(225*e^2)) - (2*b*d^(5/2)*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(15*e^2)
```

fricas [A] time = 0.48, size = 309, normalized size = 2.01

$$\left[\frac{15\,bd^{\frac{5}{2}}n\log\left(-\frac{ex^2-2\sqrt{ex^2+d}\sqrt{d}+2d}{x^2}\right)-\left(9\left(be^2n-5ae^2\right)x^4-31bd^2n+30ad^2+(8bden-15ade)x^2-15\left(3be^2x\right.\right.}{225e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/225*(15*b*d^(5/2)*n*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2)
- (9*(b*e^2*n - 5*a*e^2)*x^4 - 31*b*d^2*n + 30*a*d^2 + (8*b*d*e*n - 15*a*d*
e)*x^2 - 15*(3*b*e^2*x^4 + b*d*e*x^2 - 2*b*d^2)*log(c) - 15*(3*b*e^2*n*x^4
+ b*d*e*n*x^2 - 2*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/e^2, 1/225*(30*b*sqrt(-
d)*d^2*n*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - (9*(b*e^2*n - 5*a*e^2)*x^4 - 31
```

```
*b*d^2*n + 30*a*d^2 + (8*b*d*e*n - 15*a*d*e)*x^2 - 15*(3*b*e^2*x^4 + b*d*e*
x^2 - 2*b*d^2)*log(c) - 15*(3*b*e^2*n*x^4 + b*d*e*n*x^2 - 2*b*d^2*n)*log(x)
)*sqrt(e*x^2 + d))/e^2]
```

giac [A] time = 0.53, size = 221, normalized size = 1.44

$$\frac{1}{5}\sqrt{x^2e+d}\,bx^4\log(c)+\frac{1}{15}\sqrt{x^2e+d}\,bdx^2e^{(-1)}\log(c)+\frac{1}{5}\sqrt{x^2e+d}\,ax^4+\frac{1}{15}\sqrt{x^2e+d}\,adx^2e^{(-1)}-\frac{2}{15}\sqrt{x^2e+d}\,bd^2e^{(-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] 1/5*sqrt(x^2*e + d)*b*x^4*log(c) + 1/15*sqrt(x^2*e + d)*b*d*x^2*e^(-1)*log(
c) + 1/5*sqrt(x^2*e + d)*a*x^4 + 1/15*sqrt(x^2*e + d)*a*d*x^2*e^(-1) - 2/15
*sqrt(x^2*e + d)*b*d^2*e^(-2)*log(c) - 2/15*sqrt(x^2*e + d)*a*d^2*e^(-2) +
1/225*(15*(3*(x^2*e + d)^(5/2) - 5*(x^2*e + d)^(3/2)*d)*e^(-2)*log(x) + (30
*d^3*arctan(sqrt(x^2*e + d)/sqrt(-d))/sqrt(-d) - 9*(x^2*e + d)^(5/2) + 10*(
x^2*e + d)^(3/2)*d + 30*sqrt(x^2*e + d)*d^2)*e^(-2))*b*n
```

maple [F] time = 0.41, size = 0, normalized size = 0.00

$$\int \left(b\ln\left(c\,x^n\right)+a\right)\sqrt{e\,x^2+d}\;x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
```

```
[Out] int(x^3*(b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
```

maxima [A] time = 1.03, size = 167, normalized size = 1.08

$$\frac{1}{225}\left(\frac{15\,d^{\frac{5}{2}}\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{e^2}-\frac{9\left(ex^2+d\right)^{\frac{5}{2}}-10\left(ex^2+d\right)^{\frac{3}{2}}d-30\sqrt{ex^2+d}\,d^2}{e^2}\right)bn+\frac{1}{15}\left(\frac{3\left(ex^2+d\right)^{\frac{3}{2}}x^2}{e}-\frac{2\left(ex^2\right.}{e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/225*(15*d^(5/2)*log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + sqrt(d
)))/e^2 - (9*(e*x^2 + d)^(5/2) - 10*(e*x^2 + d)^(3/2)*d - 30*sqrt(e*x^2 + d
)*d^2)/e^2)*b*n + 1/15*(3*(e*x^2 + d)^(3/2)*x^2/e - 2*(e*x^2 + d)^(3/2)*d/e
^2)*b*log(c*x^n) + 1/15*(3*(e*x^2 + d)^(3/2)*x^2/e - 2*(e*x^2 + d)^(3/2)*d/
e^2)*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^3\,\sqrt{e\,x^2+d}\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d + e*x^2)^(1/2)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^3*(d + e*x^2)^(1/2)*(a + b*log(c*x^n)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{3}\left(a+b\log\left(cx^{n}\right)\right)\sqrt{d+ex^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))*sqrt(d + e*x**2), x)
```

3.253 $\int x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)dx$

Optimal. Leaf size=102

$$\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e}+\frac{bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e}-\frac{bdn\sqrt{d+ex^2}}{3e}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e}$$

```
[Out] -1/9*b*n*(e*x^2+d)^(3/2)/e+1/3*b*d^(3/2)*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))
/e+1/3*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/e-1/3*b*d*n*(e*x^2+d)^(1/2)/e
```

Rubi [A] time = 0.09, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2338, 266, 50, 63, 208}

$$\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e}+\frac{bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e}-\frac{bdn\sqrt{d+ex^2}}{3e}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*Sqrt[d + e*x^2])/(3*e) - (b*n*(d + e*x^2)^(3/2))/(9*e) + (b*d^(3/2)
*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e) + ((d + e*x^2)^(3/2)*(a + b*Log[
c*x^n]))/(3*e)
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
```

```
e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rubi steps

$$\int x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)dx=\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e}-\frac{(bn)\int\frac{\left(d+ex^2\right)^{3/2}}{x}dx}{3e}$$
$$=\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e}-\frac{(bn)\operatorname{Subst}\left(\int\frac{(d+ex)^{3/2}}{x}dx,x,x^2\right)}{6e}$$
$$=-\frac{bn\left(d+ex^2\right)^{3/2}}{9e}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e}-\frac{(bdn)\operatorname{Subst}\left(\int\frac{\sqrt{d+ex}}{x}\right.}{6e}$$
$$=-\frac{bdn\sqrt{d+ex^2}}{3e}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e}-\frac{\left(bd^2\right.}{}$$
$$=-\frac{bdn\sqrt{d+ex^2}}{3e}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e}-\frac{\left(bd^2\right.}{}$$
$$=-\frac{bdn\sqrt{d+ex^2}}{3e}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e}+\frac{bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e}+\frac{\left(d+ex^2\right)^{3}}{}$$

Mathematica [A] time = 0.11, size = 136, normalized size = 1.33

$$\frac{3aex^2\sqrt{d+ex^2}+3ad\sqrt{d+ex^2}+3b\left(d+ex^2\right)^{3/2}\log\left(cx^n\right)+3bd^{3/2}n\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)-3bd^{3/2}n\log(x)}{9e}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (3*a*d*Sqrt[d + e*x^2] - 4*b*d*n*Sqrt[d + e*x^2] + 3*a*e*x^2*Sqrt[d + e*x^2
] - b*e*n*x^2*Sqrt[d + e*x^2] - 3*b*d^(3/2)*n*Log[x] + 3*b*(d + e*x^2)^(3/2
)*Log[c*x^n] + 3*b*d^(3/2)*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(9*e)
```

fricas [A] time = 0.49, size = 202, normalized size = 1.98

$$\left[\frac{3\,bd^{\frac{3}{2}}n\log\left(-\frac{ex^2+2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right)-2\left(4\,bdn+(ben-3\,ae)x^2-3\,ad-3\left(bex^2+bd\right)\log(c)-3\left(benx^2+bdn\right)\right.}{18\,e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/18*(3*b*d^(3/2)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) -
2*(4*b*d*n + (b*e*n - 3*a*e)*x^2 - 3*a*d - 3*(b*e*x^2 + b*d)*log(c) - 3*(b*
e*n*x^2 + b*d*n)*log(x))*sqrt(e*x^2 + d))/e, -1/9*(3*b*sqrt(-d)*d*n*arctan(
sqrt(-d)/sqrt(e*x^2 + d)) + (4*b*d*n + (b*e*n - 3*a*e)*x^2 - 3*a*d - 3*(b*e
*x^2 + b*d)*log(c) - 3*(b*e*n*x^2 + b*d*n)*log(x))*sqrt(e*x^2 + d))/e]
```

giac [A] time = 0.51, size = 145, normalized size = 1.42

$$\frac{1}{3}\sqrt{x^2e+d}\,bx^2\log(c)+\frac{1}{3}\sqrt{x^2e+d}\,bde^{(-1)}\log(c)+\frac{1}{3}\sqrt{x^2e+d}\,ax^2+\frac{1}{3}\sqrt{x^2e+d}\,ade^{(-1)}+\frac{1}{9}\left(3\left(x^2e+d\right)^{\frac{3}{2}}e^{(-1)}\log(x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] 1/3*sqrt(x^2*e + d)*b*x^2*log(c) + 1/3*sqrt(x^2*e + d)*b*d*e^(-1)*log(c) +
1/3*sqrt(x^2*e + d)*a*x^2 + 1/3*sqrt(x^2*e + d)*a*d*e^(-1) + 1/9*(3*(x^2*e
+ d)^(3/2)*e^(-1)*log(x) - (3*d^2*arctan(sqrt(x^2*e + d)/sqrt(-d))/sqrt(-d)
 + (x^2*e + d)^(3/2) + 3*sqrt(x^2*e + d)*d)*e^(-1))*b*n
```

maple [F] time = 0.40, size = 0, normalized size = 0.00

$$\int (b\ln(c\,x^n)+a)\sqrt{e\,x^2+d}\;x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
```

```
[Out] int(x*(b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
```

maxima [A] time = 0.48, size = 85, normalized size = 0.83

$$\frac{\left(ex^2+d\right)^{\frac{3}{2}}b\log\left(cx^n\right)}{3\,e}+\frac{\left(3\,d^{\frac{3}{2}}\,\mathrm{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)-\left(ex^2+d\right)^{\frac{3}{2}}-3\,\sqrt{ex^2+d}\,d\right)bn}{9\,e}+\frac{\left(ex^2+d\right)^{\frac{3}{2}}a}{3\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*(e*x^2 + d)^(3/2)*b*log(c*x^n)/e + 1/9*(3*d^(3/2)*arcsinh(d/(sqrt(d*e)*
abs(x))) - (e*x^2 + d)^(3/2) - 3*sqrt(e*x^2 + d)*d)*b*n/e + 1/3*(e*x^2 + d)
^(3/2)*a/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\sqrt{e\,x^2+d}\;\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d + e*x^2)^(1/2)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x*(d + e*x^2)^(1/2)*(a + b*log(c*x^n)), x)
```

sympy [A] time = 23.11, size = 155, normalized size = 1.52

$$a\left(\begin{cases}\frac{\sqrt{d}x^2}{2} & \text{for}\ e=0\\ \frac{\left(d+ex^2\right)^{\frac{3}{2}}}{3e} & \text{otherwise}\end{cases}\right)-bn\left(\begin{cases}\frac{\sqrt{d}x^2}{4} & \text{for}\ e=0\\ \frac{4d^{\frac{3}{2}}\sqrt{1+\frac{ex^2}{d}}}{9e}+\frac{d^{\frac{3}{2}}\log\left(\frac{ex^2}{d}\right)}{6e}-\frac{d^{\frac{3}{2}}\log\left(\sqrt{1+\frac{ex^2}{d}}+1\right)}{3e}+\frac{\sqrt{d}x^2\sqrt{1+\frac{ex^2}{d}}}{9} & \text{otherwise}\end{cases}\right)+b\left(\left(\begin{cases}\dots\end{cases}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
```

```
[Out] a*Piecewise((sqrt(d)*x**2/2, Eq(e, 0)), ((d + e*x**2)**(3/2)/(3*e), True))
- b*n*Piecewise((sqrt(d)*x**2/4, Eq(e, 0)), (4*d**(3/2)*sqrt(1 + e*x**2/d)/
(9*e) + d**(3/2)*log(e*x**2/d)/(6*e) - d**(3/2)*log(sqrt(1 + e*x**2/d) + 1)
/(3*e) + sqrt(d)*x**2*sqrt(1 + e*x**2/d)/9, True)) + b*Piecewise((sqrt(d)*x
**2/2, Eq(e, 0)), ((d + e*x**2)**(3/2)/(3*e), True))*log(c*x**n)
```

3.254 $\int \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{x}\,dx$

Optimal. Leaf size=220

$$\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}b\sqrt{d}\,n\mathrm{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^2+d}}\right)-bn\sqrt{d+ex^2}+\frac{1}{2}b\sqrt{d}\,n$$

```
[Out] b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))*d^(1/2)+1/2*b*n*arctanh((e*x^2+d)^(1/2
)/d^(1/2))^2*d^(1/2)-b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(
1/2)-(e*x^2+d)^(1/2)))*d^(1/2)-1/2*b*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(e*x^
2+d)^(1/2)))*d^(1/2)-b*n*(e*x^2+d)^(1/2)+(a+b*ln(c*x^n))*(-arctanh((e*x^2+d
)^(1/2)/d^(1/2))*d^(1/2)+(e*x^2+d)^(1/2))
```

Rubi [A] time = 0.33, antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 50, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{1}{2}b\sqrt{d}\,n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)+\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)\left(a+b\log\left(cx^n\right)\right)-bn\sqrt{d+ex^2}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -(b*n*Sqrt[d + e*x^2]) + b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]] + (b*
Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/2 + (Sqrt[d + e*x^2] - Sqrt[d
]*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])*(a + b*Log[c*x^n]) - b*Sqrt[d]*n*ArcTan
h[Sqrt[d + e*x^2]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])] - (
b*Sqrt[d]*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/2
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{x}dx = \left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)\left(a+b\log(cx^n)\right)-(bn)\int\left(\frac{\sqrt{d+ex^2}}{x}\right.$$

$$=\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)\left(a+b\log(cx^n)\right)-(bn)\int\frac{\sqrt{d+ex^2}}{x}d$$

$$=\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)\left(a+b\log(cx^n)\right)-\frac{1}{2}(bn)\operatorname{Subst}\left(\int\right.$$

$$=-bn\sqrt{d+ex^2}+\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)\left(a+b\log(cx^n)\right)+(b$$

$$=-bn\sqrt{d+ex^2}+\frac{1}{2}b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2+\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\right.\right.$$

$$=-bn\sqrt{d+ex^2}+b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2+$$

$$=-bn\sqrt{d+ex^2}+b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2+$$

$$=-bn\sqrt{d+ex^2}+b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2+$$

Mathematica [C] time = 0.33, size = 203, normalized size = 0.92

$$\frac{bn\sqrt{d+ex^2}\left(-{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{d}{ex^2}\right)+\log(x)\sqrt{\frac{d}{ex^2}+1}-\frac{\sqrt{d}\log(x)\sinh^{-1}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)}{\sqrt{e}x}\right)}{\sqrt{\frac{d}{ex^2}+1}}+\sqrt{d+ex^2}\left(a+b\log(cx^n)-\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (b*n*Sqrt[d + e*x^2]*(-HypergeometricPFQ[{-1/2, -1/2, -1/2}, {1/2, 1/2}, -(
d/(e*x^2))] + Sqrt[1 + d/(e*x^2)]*Log[x] - (Sqrt[d]*ArcSinh[Sqrt[d]/(Sqrt[e
]*x)]*Log[x])/(Sqrt[e]*x)))/Sqrt[1 + d/(e*x^2)] + Sqrt[d + e*x^2]*(a - b*n*
Log[x] + b*Log[c*x^n]) + Sqrt[d]*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n]) - S
qrt[d]*(a - b*n*Log[x] + b*Log[c*x^n])*Log[d + Sqrt[d]*Sqrt[d + e*x^2]]
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,b\log(cx^n)+\sqrt{ex^2+d}\,a}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x,x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ex^2+d}\left(b\log\left(cx^n\right)+a\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x, x)
```

maple [F] time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{e\,x^2+d}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x,x)
```

```
[Out] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\left(\sqrt{d}\ \mathrm{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)-\sqrt{ex^2+d}\right)a+b\int \frac{\sqrt{ex^2+d}\left(\log(c)+\log\left(x^n\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] -(sqrt(d)*arcsinh(d/(sqrt(d*e)*abs(x))) - sqrt(e*x^2 + d))*a + b*integrate(
sqrt(e*x^2 + d)*(log(c) + log(x^n))/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{e\,x^2+d}\ \left(a+b\,\ln\left(c\,x^n\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x,x)
```

```
[Out] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)\sqrt{d+ex^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2)/x, x)
```

3.255 $\int \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{x^3}\,dx$

Optimal. Leaf size=252

$$-\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}}-\frac{ben\mathrm{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^2+d}}\right)}{4\sqrt{d}}-\frac{bn\sqrt{d+ex^2}}{4x^2}+\frac{ben\ \mathrm{ta}}{}$$

```
[Out] -1/4*b*e*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(1/2)+1/4*b*e*n*arctanh((e*x^
2+d)^(1/2)/d^(1/2))^2/d^(1/2)-1/2*e*arctanh((e*x^2+d)^(1/2)/d^(1/2))*(a+b*l
n(c*x^n))/d^(1/2)-1/2*b*e*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(
d^(1/2)-(e*x^2+d)^(1/2)))/d^(1/2)-1/4*b*e*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-
(e*x^2+d)^(1/2)))/d^(1/2)-1/4*b*n*(e*x^2+d)^(1/2)/x^2-1/2*(a+b*ln(c*x^n))*(
e*x^2+d)^(1/2)/x^2
```

Rubi [A] time = 0.38, antiderivative size = 252, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {266, 47, 63, 208, 2350, 12, 14, 5984, 5918, 2402, 2315}

$$-\frac{ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4\sqrt{d}}-\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}}-\frac{bn\sqrt{d+ex^2}}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*n*Sqrt[d + e*x^2])/(4*x^2) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(
4*Sqrt[d]) + (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(4*Sqrt[d]) - (Sqrt
[d + e*x^2]*(a + b*Log[c*x^n]))/(2*x^2) - (e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d
]]*(a + b*Log[c*x^n]))/(2*Sqrt[d]) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]
]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*Sqrt[d]) - (b*e*n*PolyLo
g[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*Sqrt[d])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
```

```
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx = -\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}} - (bn)\int$$

$$= -\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}} - \frac{1}{2}(bn)\int$$

$$= -\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}} - \frac{1}{2}(bn)\int$$

$$= -\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}} + \frac{1}{2}(bn)\int$$

$$= -\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{d}} + \frac{1}{4}(bn)\,\mathrm{S}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4x^2} - \frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(c\right.}{2\sqrt{d}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4x^2} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4\sqrt{d}} - \frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{2x^2} - \frac{e\tanh}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4x^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4\sqrt{d}} - \frac{\sqrt{d+ex^2}\,(a}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4x^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4\sqrt{d}} - \frac{\sqrt{d+ex^2}\,(a}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4x^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4\sqrt{d}} - \frac{\sqrt{d+ex^2}\,(a}{}$$

Mathematica [C] time = 0.56, size = 303, normalized size = 1.20

$$\frac{-2b\sqrt{d}\,n\sqrt{d+ex^2}\;{}_3F_2\left(\frac{1}{2},\frac{1}{2},\frac{1}{2};\frac{3}{2},\frac{3}{2};-\frac{d}{ex^2}\right)+\sqrt{\frac{d}{ex^2}+1}\,\left(2ex^2\log(x)\left(a+b\log\left(cx^n\right)+bn\log\left(\sqrt{d}\,\sqrt{d+ex^2}\,+d\right)\right)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] (-2*b*Sqrt[d]*n*Sqrt[d + e*x^2]*HypergeometricPFQ[{1/2, 1/2, 1/2}, {3/2, 3/
2}, -(d/(e*x^2))] - b*Sqrt[e]*n*x*Sqrt[d + e*x^2]*ArcSinh[Sqrt[d]/(Sqrt[e]*
x)]*(1 + 2*Log[x]) + Sqrt[1 + d/(e*x^2)]*(-2*a*Sqrt[d]*Sqrt[d + e*x^2] - b*
Sqrt[d]*n*Sqrt[d + e*x^2] - 2*b*e*n*x^2*Log[x]^2 - 2*a*e*x^2*Log[d + Sqrt[d
]*Sqrt[d + e*x^2]] + 2*e*x^2*Log[x]*(a + b*Log[c*x^n] + b*n*Log[d + Sqrt[d]
*Sqrt[d + e*x^2]]) - 2*b*Log[c*x^n]*(Sqrt[d]*Sqrt[d + e*x^2] + e*x^2*Log[d
+ Sqrt[d]*Sqrt[d + e*x^2]])))/(4*Sqrt[d]*Sqrt[1 + d/(e*x^2)]*x^2)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,b\log\left(cx^n\right)+\sqrt{ex^2+d}\,a}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^3,x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ex^2+d}\left(b\log\left(cx^n\right)+a\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x^3, x)
```

maple [F] time = 0.38, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{e\,x^2+d}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x^3,x)
```

```
[Out] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\left(\frac{e\,\text{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{\sqrt{d}}-\frac{\sqrt{ex^2+d}\,e}{d}+\frac{\left(ex^2+d\right)^{\frac{3}{2}}}{dx^2}\right)a+b\int \frac{\sqrt{ex^2+d}\left(\log(c)+\log\left(x^n\right)\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*(e*arcsinh(d/(sqrt(d*e)*abs(x)))/sqrt(d) - sqrt(e*x^2 + d)*e/d + (e*x^
2 + d)^(3/2)/(d*x^2))*a + b*integrate(sqrt(e*x^2 + d)*(log(c) + log(x^n))/x
^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{e\,x^2+d}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x^3,x)
```

```
[Out] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \log\left(cx^{n}\right)\right) \sqrt{d + ex^{2}}}{x^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2)/x**3, x)
```

3.256 $\int x^4\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)dx$

Optimal. Leaf size=469

$$\frac{d^{5/2}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{16e^{5/2}\sqrt{\frac{ex^2}{d}+1}}-\frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e^2}+\frac{1}{6}x^5\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)+$$

```
[Out] 7/192*b*d^2*n*x*(e*x^2+d)^(1/2)/e^2-5/288*b*d*n*x^3*(e*x^2+d)^(1/2)/e-1/36*
b*n*x^5*(e*x^2+d)^(1/2)-1/16*d^2*x*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/e^2+1/24
*d*x^3*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/e+1/6*x^5*(a+b*ln(c*x^n))*(e*x^2+d)^
(1/2)+5/192*b*d^(5/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*(e*x^2+d)^(1/2)/e^(5/2)/
(1+e*x^2/d)^(1/2)+1/32*b*d^(5/2)*n*arcsinh(x*e^(1/2)/d^(1/2))^2*(e*x^2+d)^(
1/2)/e^(5/2)/(1+e*x^2/d)^(1/2)-1/16*b*d^(5/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*
ln(1-(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*(e*x^2+d)^(1/2)/e^(5/2)/(1+e*
x^2/d)^(1/2)+1/16*d^(5/2)*arcsinh(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*(e*x^2
+d)^(1/2)/e^(5/2)/(1+e*x^2/d)^(1/2)-1/32*b*d^(5/2)*n*polylog(2,(x*e^(1/2)/d
^(1/2)+(1+e*x^2/d)^(1/2))^2)*(e*x^2+d)^(1/2)/e^(5/2)/(1+e*x^2/d)^(1/2)
```

Rubi [A] time = 0.60, antiderivative size = 469, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {2341, 279, 321, 215, 2350, 12, 14, 195, 5659, 3716, 2190, 2279, 2391}

$$-\frac{bd^{5/2}n\sqrt{d+ex^2}\,\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{32e^{5/2}\sqrt{\frac{ex^2}{d}+1}}-\frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e^2}+\frac{d^{5/2}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+\right.}{16e^{5/2}\sqrt{\frac{ex^2}{d}+1}}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (7*b*d^2*n*x*Sqrt[d + e*x^2])/(192*e^2) - (5*b*d*n*x^3*Sqrt[d + e*x^2])/(28
8*e) - (b*n*x^5*Sqrt[d + e*x^2])/36 + (5*b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSin
h[(Sqrt[e]*x)/Sqrt[d]])/(192*e^(5/2)*Sqrt[1 + (e*x^2)/d]) + (b*d^(5/2)*n*Sq
rt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(32*e^(5/2)*Sqrt[1 + (e*x^2)/
d]) - (b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(
2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(16*e^(5/2)*Sqrt[1 + (e*x^2)/d]) - (d^2*x
*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(16*e^2) + (d*x^3*Sqrt[d + e*x^2]*(a +
 b*Log[c*x^n]))/(24*e) + (x^5*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/6 + (d^(5
/2)*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(16*e^
(5/2)*Sqrt[1 + (e*x^2)/d]) - (b*d^(5/2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(32*e^(5/2)*Sqrt[1 + (e*x^2)/d])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
```

```
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 279

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + n*p + 1)), x] + Dist[(a*n*p)/(m + n*p +
1), Int[(c*x)^m*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c, m}, x] && IG
tQ[n, 0] && GtQ[p, 0] && NeQ[m + n*p + 1, 0] && IntBinomialQ[a, b, c, n, m,
 p, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
```

```
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int x^4\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)dx=\frac{\sqrt{d+ex^2}\int x^4\sqrt{1+\frac{ex^2}{d}}\left(a+b\log\left(cx^n\right)\right)dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$=-\frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e^2}+\frac{dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{24e}+\frac{1}{6}x^5\sqrt{d}$$

$$=-\frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e^2}+\frac{dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{24e}+\frac{1}{6}x^5\sqrt{d}$$

$$=-\frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e^2}+\frac{dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{24e}+\frac{1}{6}x^5\sqrt{d}$$

$$=-\frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e^2}+\frac{dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{24e}+\frac{1}{6}x^5\sqrt{d}$$

$$=\frac{bd^2nx\sqrt{d+ex^2}}{32e^2}-\frac{bdnx^3\sqrt{d+ex^2}}{96e}-\frac{1}{36}bnx^5\sqrt{d+ex^2}-\frac{d^2x\sqrt{d+ex^2}\left(a+\right.}{16e^2}$$

$$=\frac{5bd^2nx\sqrt{d+ex^2}}{192e^2}-\frac{5bdnx^3\sqrt{d+ex^2}}{288e}-\frac{1}{36}bnx^5\sqrt{d+ex^2}+\frac{bd^{5/2}n\sqrt{d+ex}}{32e^{5/2}\sqrt{}}$$

$$=\frac{7bd^2nx\sqrt{d+ex^2}}{192e^2}-\frac{5bdnx^3\sqrt{d+ex^2}}{288e}-\frac{1}{36}bnx^5\sqrt{d+ex^2}+\frac{7bd^{5/2}n\sqrt{d+e}}{192e^{5/2}}$$

$$=\frac{7bd^2nx\sqrt{d+ex^2}}{192e^2}-\frac{5bdnx^3\sqrt{d+ex^2}}{288e}-\frac{1}{36}bnx^5\sqrt{d+ex^2}+\frac{5bd^{5/2}n\sqrt{d+e}}{192e^{5/2}}$$

$$=\frac{7bd^2nx\sqrt{d+ex^2}}{192e^2}-\frac{5bdnx^3\sqrt{d+ex^2}}{288e}-\frac{1}{36}bnx^5\sqrt{d+ex^2}+\frac{5bd^{5/2}n\sqrt{d+e}}{192e^{5/2}}$$

Mathematica [C] time = 0.61, size = 276, normalized size = 0.59

$$\frac{-48be^{5/2}nx^5\sqrt{d+ex^2}\,{}_3F_2\left(-\frac{1}{2},\frac{5}{2},\frac{5}{2};\frac{7}{2},\frac{7}{2};-\frac{ex^2}{d}\right)+25\sqrt{\frac{ex^2}{d}+1}\left(3d^3\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)(a-bn\log(x))+a\sqrt{e}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-48*b*e^(5/2)*n*x^5*Sqrt[d + e*x^2]*HypergeometricPFQ[{-1/2, 5/2, 5/2}, {7
/2, 7/2}, -((e*x^2)/d)] + 75*b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x
)/Sqrt[d]]*Log[x] + 25*Sqrt[1 + (e*x^2)/d]*(a*Sqrt[e]*x*Sqrt[d + e*x^2]*(-3
*d^2 + 2*d*e*x^2 + 8*e^2*x^4) + 3*d^3*(a - b*n*Log[x])*Log[e*x + Sqrt[e]*Sq
rt[d + e*x^2]] + b*Log[c*x^n]*(Sqrt[e]*x*Sqrt[d + e*x^2]*(-3*d^2 + 2*d*e*x^
2 + 8*e^2*x^4) + 3*d^3*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])))/(1200*e^(5/2)*
Sqrt[1 + (e*x^2)/d])
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{ex^2+d}\,bx^4\log\left(cx^n\right)+\sqrt{ex^2+d}\,ax^4,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)*b*x^4*log(c*x^n) + sqrt(e*x^2 + d)*a*x^4, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ex^2+d}\left(b\log\left(cx^n\right)+a\right)x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)*x^4, x)
```

maple [F] time = 0.37, size = 0, normalized size = 0.00

$$\int \left(b\ln\left(c\,x^n\right)+a\right)\sqrt{e\,x^2+d}\;x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
[Out] int(x^4*(b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{48}\left(\frac{8\left(ex^2+d\right)^{\frac{3}{2}}x^3}{e}-\frac{6\left(ex^2+d\right)^{\frac{3}{2}}dx}{e^2}+\frac{3\sqrt{ex^2+d}\,d^2x}{e^2}+\frac{3\,d^3\,\text{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{e^{\frac{5}{2}}}\right)a+b\int\left(x^4\log(c)+x^4\log\left(x^n\right)\right)\sqrt{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
[Out] 1/48*(8*(e*x^2 + d)^(3/2)*x^3/e - 6*(e*x^2 + d)^(3/2)*d*x/e^2 + 3*sqrt(e*x^
2 + d)*d^2*x/e^2 + 3*d^3*arcsinh(e*x/sqrt(d*e))/e^(5/2))*a + b*integrate((x
^4*log(c) + x^4*log(x^n))*sqrt(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^4\,\sqrt{e\,x^2+d}\;\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d + e*x^2)^(1/2)*(a + b*log(c*x^n)),x)
[Out] int(x^4*(d + e*x^2)^(1/2)*(a + b*log(c*x^n)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^4\left(a+b\log\left(cx^n\right)\right)\sqrt{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**4*(a + b*log(c*x**n))*sqrt(d + e*x**2), x)
```

3.257 $\int x^2\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=409

$$-\frac{d^{3/2}\sqrt{d+ex^2}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{8e^{3/2}\sqrt{\frac{ex^2}{d}+1}}+\frac{dx\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{8e}+\frac{1}{4}x^3\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)$$

```
[Out] -3/32*b*d*n*x*(e*x^2+d)^(1/2)/e-1/16*b*n*x^3*(e*x^2+d)^(1/2)+1/8*d*x*(a+b*l
n(c*x^n))*(e*x^2+d)^(1/2)/e+1/4*x^3*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)-1/32*b*
d^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*(e*x^2+d)^(1/2)/e^(3/2)/(1+e*x^2/d)^(1
/2)-1/16*b*d^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))^2*(e*x^2+d)^(1/2)/e^(3/2)/(
1+e*x^2/d)^(1/2)+1/8*b*d^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*ln(1-(x*e^(1/2)
/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*(e*x^2+d)^(1/2)/e^(3/2)/(1+e*x^2/d)^(1/2)-1/
8*d^(3/2)*arcsinh(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/e^(3/2
)/(1+e*x^2/d)^(1/2)+1/16*b*d^(3/2)*n*polylog(2,(x*e^(1/2)/d^(1/2)+(1+e*x^2/
d)^(1/2))^2)*(e*x^2+d)^(1/2)/e^(3/2)/(1+e*x^2/d)^(1/2)
```

Rubi [A] time = 0.41, antiderivative size = 410, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {2341, 279, 321, 215, 2350, 388, 195, 5659, 3716, 2190, 2279, 2391}

$$\frac{bd^{3/2}n\sqrt{d+ex^2}\,\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{16e^{3/2}\sqrt{\frac{ex^2}{d}+1}}-\frac{d^{3/2}\sqrt{d+ex^2}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{8e^{3/2}\sqrt{\frac{ex^2}{d}+1}}+\frac{1}{4}x^3\sqrt{d+ex^2}\,\left(a+b\right.$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x*Sqrt[d + e*x^2])/(32*e) - (b*n*x*(d + e*x^2)^(3/2))/(16*e) - (b*d
^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(32*e^(3/2)*Sqrt[1 +
 (e*x^2)/d]) - (b*d^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)
/(16*e^(3/2)*Sqrt[1 + (e*x^2)/d]) + (b*d^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(S
qrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(8*e^(3/2)*
Sqrt[1 + (e*x^2)/d]) + (d*x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(8*e) + (x^
3*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/4 - (d^(3/2)*Sqrt[d + e*x^2]*ArcSinh[
(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(8*e^(3/2)*Sqrt[1 + (e*x^2)/d]) +
(b*d^(3/2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])]
)/(16*e^(3/2)*Sqrt[1 + (e*x^2)/d])
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 279

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + n*p + 1)), x] + Dist[(a*n*p)/(m + n*p +
```

```
1), Int[(c*x)^m*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c, m}, x] && IG
tQ[n, 0] && GtQ[p, 0] && NeQ[m + n*p + 1, 0] && IntBinomialQ[a, b, c, n, m,
 p, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
```

```
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int x^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)dx = \frac{\sqrt{d+ex^2}\int x^2\sqrt{1+\frac{ex^2}{d}}\left(a+b\log\left(cx^n\right)\right)dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$= \frac{dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{8e} + \frac{1}{4}x^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) - \frac{d^{3/2}\sqrt{c}}{}$$

$$= \frac{dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{8e} + \frac{1}{4}x^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) - \frac{d^{3/2}\sqrt{c}}{}$$

$$= -\frac{bnx\left(d+ex^2\right)^{3/2}}{16e} + \frac{dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{8e} + \frac{1}{4}x^3\sqrt{d+ex^2}\left(a+\right.$$

$$= -\frac{bdnx\sqrt{d+ex^2}}{32e} - \frac{bnx\left(d+ex^2\right)^{3/2}}{16e} - \frac{bd^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{16e^{3/2}\sqrt{1+\frac{ex^2}{d}}} +$$

$$= -\frac{bdnx\sqrt{d+ex^2}}{32e} - \frac{bnx\left(d+ex^2\right)^{3/2}}{16e} - \frac{bd^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{32e^{3/2}\sqrt{1+\frac{ex^2}{d}}} - $$

$$= -\frac{bdnx\sqrt{d+ex^2}}{32e} - \frac{bnx\left(d+ex^2\right)^{3/2}}{16e} - \frac{bd^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{32e^{3/2}\sqrt{1+\frac{ex^2}{d}}} - $$

$$= -\frac{bdnx\sqrt{d+ex^2}}{32e} - \frac{bnx\left(d+ex^2\right)^{3/2}}{16e} - \frac{bd^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{32e^{3/2}\sqrt{1+\frac{ex^2}{d}}} - $$

Mathematica [C] time = 0.46, size = 250, normalized size = 0.61

$$\frac{-8be^{3/2}nx^3\sqrt{d+ex^2}\,{}_3F_2\left(-\frac{1}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};-\frac{ex^2}{d}\right)+9\sqrt{\frac{ex^2}{d}+1}\left(d^2\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)(bn\log(x)-a)+a\sqrt{e}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-8*b*e^(3/2)*n*x^3*Sqrt[d + e*x^2]*HypergeometricPFQ[{-1/2, 3/2, 3/2}, {5/
2, 5/2}, -((e*x^2)/d)] - 9*b*d^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/
Sqrt[d]]*Log[x] + 9*Sqrt[1 + (e*x^2)/d]*(a*Sqrt[e]*x*Sqrt[d + e*x^2]*(d + 2
*e*x^2) + d^2*(-a + b*n*Log[x])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]] + b*Log[
c*x^n]*(Sqrt[e]*x*Sqrt[d + e*x^2]*(d + 2*e*x^2) - d^2*Log[e*x + Sqrt[e]*Sqr
t[d + e*x^2]])))/(72*e^(3/2)*Sqrt[1 + (e*x^2)/d])
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{ex^2+d}\,bx^2\log\left(cx^n\right)+\sqrt{ex^2+d}\,ax^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*b*x^2*log(c*x^n) + sqrt(e*x^2 + d)*a*x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{ex^2+d}\left(b\log\left(cx^n\right)+a\right)x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)*x^2, x)
```

maple [F] time = 0.37, size = 0, normalized size = 0.00

$$\int\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{e\,x^2+d}\;x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
```

```
[Out] int(x^2*(b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{8}\left(\frac{2\left(ex^2+d\right)^{\frac{3}{2}}x}{e}-\frac{\sqrt{ex^2+d}\,dx}{e}-\frac{d^2\,\text{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{e^{\frac{3}{2}}}\right)a+b\int\sqrt{ex^2+d}\left(x^2\log(c)+x^2\log\left(x^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/8*(2*(e*x^2 + d)^(3/2)*x/e - sqrt(e*x^2 + d)*d*x/e - d^2*arcsinh(e*x/sqrt
(d*e))/e^(3/2))*a + b*integrate(sqrt(e*x^2 + d)*(x^2*log(c) + x^2*log(x^n))
, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\sqrt{e\,x^2+d}\;\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d + e*x^2)^(1/2)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^2*(d + e*x^2)^(1/2)*(a + b*log(c*x^n)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^2 \left(a + b \log \left(cx^n\right)\right) \sqrt{d + ex^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))*sqrt(d + e*x**2), x)
```

3.258 $\int \sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=330

$$\frac{d^{3/2}\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{e}\sqrt{d+ex^2}}+\frac{1}{2}x\sqrt{d+ex^2}\,(a+b\log(cx^n))-\frac{bd^{3/2}n\sqrt{\frac{ex^2}{d}+1}\,\mathrm{Li}_2\left(e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4\sqrt{e}\sqrt{d+ex^2}}+$$

```
[Out] -1/4*b*d*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/e^(1/2)-1/4*b*n*x*(e*x^2+d)^(
1/2)+1/2*x*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)+1/4*b*d^(3/2)*n*arcsinh(x*e^(1/2
)/d^(1/2))^2*(1+e*x^2/d)^(1/2)/e^(1/2)/(e*x^2+d)^(1/2)-1/2*b*d^(3/2)*n*arcs
inh(x*e^(1/2)/d^(1/2))*ln(1-(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*(1+e*x
^2/d)^(1/2)/e^(1/2)/(e*x^2+d)^(1/2)+1/2*d^(3/2)*arcsinh(x*e^(1/2)/d^(1/2))*
(a+b*ln(c*x^n))*(1+e*x^2/d)^(1/2)/e^(1/2)/(e*x^2+d)^(1/2)-1/4*b*d^(3/2)*n*p
olylog(2,(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*(1+e*x^2/d)^(1/2)/e^(1/2)
/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.20, antiderivative size = 330, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {2321, 195, 217, 206, 2327, 2325, 5659, 3716, 2190, 2279, 2391}

$$-\frac{bd^{3/2}n\sqrt{\frac{ex^2}{d}+1}\,\mathrm{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4\sqrt{e}\sqrt{d+ex^2}}+\frac{d^{3/2}\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{e}\sqrt{d+ex^2}}+\frac{1}{2}x\sqrt{d+ex^2}\,(a+b\log$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*n*x*Sqrt[d + e*x^2])/4 + (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt
[e]*x)/Sqrt[d]]^2)/(4*Sqrt[e]*Sqrt[d + e*x^2]) - (b*d*n*ArcTanh[(Sqrt[e]*x)
/Sqrt[d + e*x^2]])/(4*Sqrt[e]) - (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[e]
*Sqrt[d + e*x^2]) + (x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/2 + (d^(3/2)*Sqr
t[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*Sqrt[e
]*Sqrt[d + e*x^2]) - (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcSi
nh[(Sqrt[e]*x)/Sqrt[d]])])/(4*Sqrt[e]*Sqrt[d + e*x^2])
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2321

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Sy
mbol] :> Simp[(x*(d + e*x^2)^q*(a + b*Log[c*x^n]))/(2*q + 1), x] + (-Dist[(
b*n)/(2*q + 1), Int[(d + e*x^2)^q, x], x] + Dist[(2*d*q)/(2*q + 1), Int[(d
+ e*x^2)^(q - 1)*(a + b*Log[c*x^n]), x], x]) /; FreeQ[{a, b, c, d, e, n}, x
] && GtQ[q, 0]
```

Rule 2325

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[e, 2], x]
 - Dist[(b*n)/Rt[e, 2], Int[ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]/x, x], x] /; Free
Q[{a, b, c, d, e, n}, x] && GtQ[d, 0] && PosQ[e]
```

Rule 2327

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Dist[Sqrt[1 + (e*x^2)/d]/Sqrt[d + e*x^2], Int[(a + b*Log[c*x^n])/Sqr
t[1 + (e*x^2)/d], x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&  !GtQ[d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int \sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)dx = \frac{1}{2}x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}d\int\frac{a+b\log\left(cx^n\right)}{\sqrt{d+ex^2}}dx-\frac{1}{2}(bn)\int\sqrt{d+ex^2}$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2}+\frac{1}{2}x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(bdn)\int\frac{1}{\sqrt{d+ex^2}}dx+$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2}+\frac{1}{2}x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)+\frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right.}{2\sqrt{e}\sqrt{d+}}$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2}-\frac{bdn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{4\sqrt{e}}+\frac{1}{2}x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)+-$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2}+\frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4\sqrt{e}\sqrt{d+ex^2}}-\frac{bdn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{4\sqrt{e}}+$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2}+\frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4\sqrt{e}\sqrt{d+ex^2}}-\frac{bdn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{4\sqrt{e}}-$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2}+\frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4\sqrt{e}\sqrt{d+ex^2}}-\frac{bdn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{4\sqrt{e}}-$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2}+\frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4\sqrt{e}\sqrt{d+ex^2}}-\frac{bdn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{4\sqrt{e}}-$$

Mathematica [C] time = 0.36, size = 237, normalized size = 0.72

$$\frac{-2b\sqrt{e}nx\sqrt{d+ex^2}\,{}_3F_2\left(\frac{1}{2},\frac{1}{2},\frac{1}{2};\frac{3}{2},\frac{3}{2};-\frac{ex^2}{d}\right)+\sqrt{\frac{ex^2}{d}+1}\left(\sqrt{e}x(2a-bn)\sqrt{d+ex^2}+2d\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)(a-\right.}{4\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-2*b*Sqrt[e]*n*x*Sqrt[d + e*x^2]*HypergeometricPFQ[{1/2, 1/2, 1/2}, {3/2,
3/2}, -((e*x^2)/d)] + b*Sqrt[d]*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[
d]]*(-1 + 2*Log[x]) + Sqrt[1 + (e*x^2)/d]*(Sqrt[e]*(2*a - b*n)*x*Sqrt[d + e
*x^2] + 2*d*(a - b*n*Log[x])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]] + 2*b*Log[c
*x^n]*(Sqrt[e]*x*Sqrt[d + e*x^2] + d*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])))/
(4*Sqrt[e]*Sqrt[1 + (e*x^2)/d])
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\sqrt{ex^2+d}\,b\log\left(cx^n\right)+\sqrt{ex^2+d}\,a,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ex^2+d}\left(b\log\left(cx^n\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a), x)
```

maple [F] time = 0.38, size = 0, normalized size = 0.00

$$\int \left(b\ln\left(c\,x^n\right)+a\right)\sqrt{e\,x^2+d}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
[Out] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\left(\sqrt{ex^2+d}\,x+\frac{d\,\operatorname{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{e}}\right)a+b\int \sqrt{ex^2+d}\left(\log(c)+\log\left(x^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
[Out] 1/2*(sqrt(e*x^2 + d)*x + d*arcsinh(e*x/sqrt(d*e))/sqrt(e))*a + b*integrate(
sqrt(e*x^2 + d)*(log(c) + log(x^n)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \sqrt{e\,x^2+d}\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)^(1/2)*(a + b*log(c*x^n)),x)
[Out] int((d + e*x^2)^(1/2)*(a + b*log(c*x^n)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a+b\log\left(cx^n\right)\right)\sqrt{d+ex^2}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2), x)
```

3.259 $\int \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{x^2}\,dx$

Optimal. Leaf size=345

$$-\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{\sqrt{e}\,\sqrt{d+ex^2}\,\sinh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\,\sqrt{\frac{ex^2}{d}+1}}-\frac{b\sqrt{e}\,n\sqrt{d+ex^2}\,\mathrm{Li}_2\left(e^{2\sinh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}\right)}{2\sqrt{d}\,\sqrt{\frac{ex^2}{d}+1}}-\frac{b\ldots}{}$$

```
[Out] -b*n*(e*x^2+d)^(1/2)/x-(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x+b*n*arcsinh(x*e^(1
/2)/d^(1/2))*e^(1/2)*(e*x^2+d)^(1/2)/d^(1/2)/(1+e*x^2/d)^(1/2)+1/2*b*n*arcs
inh(x*e^(1/2)/d^(1/2))^2*e^(1/2)*(e*x^2+d)^(1/2)/d^(1/2)/(1+e*x^2/d)^(1/2)-
b*n*arcsinh(x*e^(1/2)/d^(1/2))*ln(1-(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2
)*e^(1/2)*(e*x^2+d)^(1/2)/d^(1/2)/(1+e*x^2/d)^(1/2)+arcsinh(x*e^(1/2)/d^(1/
2))*(a+b*ln(c*x^n))*e^(1/2)*(e*x^2+d)^(1/2)/d^(1/2)/(1+e*x^2/d)^(1/2)-1/2*b
*n*polylog(2,(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*e^(1/2)*(e*x^2+d)^(1/
2)/d^(1/2)/(1+e*x^2/d)^(1/2)
```

Rubi [A] time = 0.39, antiderivative size = 345, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {2341, 277, 215, 2350, 14, 5659, 3716, 2190, 2279, 2391}

$$-\frac{b\sqrt{e}\,n\sqrt{d+ex^2}\,\mathrm{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}\right)}{2\sqrt{d}\,\sqrt{\frac{ex^2}{d}+1}}-\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{\sqrt{e}\,\sqrt{d+ex^2}\,\sinh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(c\ldots\right.\right.}{\sqrt{d}\,\sqrt{\frac{ex^2}{d}+1}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*n*Sqrt[d + e*x^2])/x) + (b*Sqrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*
x)/Sqrt[d]])/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) + (b*Sqrt[e]*n*Sqrt[d + e*x^2]*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(2*Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*Sqrt[e]
*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[
e]*x)/Sqrt[d]])])/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (Sqrt[d + e*x^2]*(a + b*L
og[c*x^n]))/x + (Sqrt[e]*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a +
b*Log[c*x^n]))/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*Sqrt[e]*n*Sqrt[d + e*x^2]
*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[d]*Sqrt[1 + (e*x^2
)/d])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
```

```
nomialQ[a, b, c, n, m, p, x]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx = \frac{\sqrt{d+ex^2}\int \frac{\sqrt{1+\frac{ex^2}{d}}\left(a+b\log(cx^n)\right)}{x^2}\,dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{\sqrt{e}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} -$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{\sqrt{e}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} -$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{\sqrt{e}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} +$$

$$= -\frac{bn\sqrt{d+ex^2}}{x} - \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{\sqrt{e}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{x} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right.}{2\sqrt{d}\sqrt{1+\frac{ex^2}{d}}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{x} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right.}{2\sqrt{d}\sqrt{1+\frac{ex^2}{d}}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{x} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right.}{2\sqrt{d}\sqrt{1+\frac{ex^2}{d}}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{x} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right.}{2\sqrt{d}\sqrt{1+\frac{ex^2}{d}}}$$

Mathematica [C] time = 0.66, size = 183, normalized size = 0.53

$$\frac{bn\sqrt{d+ex^2}\left(-{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{ex^2}{d}\right)-\log(x)\sqrt{\frac{ex^2}{d}+1}+\frac{\sqrt{e}x\log(x)\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}}\right)}{x\sqrt{\frac{ex^2}{d}+1}} - \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right.}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] (b*n*Sqrt[d + e*x^2]*(-HypergeometricPFQ[{-1/2, -1/2, -1/2}, {1/2, 1/2}, -(
(e*x^2)/d)] - Sqrt[1 + (e*x^2)/d]*Log[x] + (Sqrt[e]*x*ArcSinh[(Sqrt[e]*x)/S
```

```
qrt[d]]*Log[x])/Sqrt[d]))/(x*Sqrt[1 + (e*x^2)/d]) - (Sqrt[d + e*x^2]*(a - b
*n*Log[x] + b*Log[c*x^n]))/x + Sqrt[e]*(a - b*n*Log[x] + b*Log[c*x^n])*Log[
e*x + Sqrt[e]*Sqrt[d + e*x^2]]
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,b\log\left(cx^n\right)+\sqrt{ex^2+d}\,a}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^2,x, algorithm="fricas")
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sqrt{ex^2+d}\left(b\log\left(cx^n\right)+a\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^2,x, algorithm="giac")
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x^2, x)
```

maple [F] time = 0.38, size = 0, normalized size = 0.00

$$\int\frac{\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{e\,x^2+d}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x^2,x)
[Out] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\left(\sqrt{e}\,\operatorname{arsinh}\left(\frac{ex}{\sqrt{de}}\right)-\frac{\sqrt{ex^2+d}}{x}\right)a+b\int\frac{\sqrt{ex^2+d}\left(\log(c)+\log\left(x^n\right)\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^2,x, algorithm="maxima")
[Out] (sqrt(e)*arcsinh(e*x/sqrt(d*e)) - sqrt(e*x^2 + d)/x)*a + b*integrate(sqrt(e
*x^2 + d)*(log(c) + log(x^n))/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\sqrt{e\,x^2+d}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x^2,x)
[Out] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a+b\log\left(cx^n\right)\right)\sqrt{d+ex^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2)/x**2, x)
```

3.260 $\int \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{x^4}\,dx$

Optimal. Leaf size=112

$$-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3dx^3}+\frac{be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d}-\frac{ben\sqrt{d+ex^2}}{3dx}-\frac{bn\left(d+ex^2\right)^{3/2}}{9dx^3}$$

```
[Out] -1/9*b*n*(e*x^2+d)^(3/2)/d/x^3+1/3*b*e^(3/2)*n*arctanh(x*e^(1/2)/(e*x^2+d)^
(1/2))/d-1/3*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/d/x^3-1/3*b*e*n*(e*x^2+d)^(1/2
)/d/x
```

Rubi [A] time = 0.10, antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2335, 277, 217, 206}

$$-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3dx^3}+\frac{be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d}-\frac{ben\sqrt{d+ex^2}}{3dx}-\frac{bn\left(d+ex^2\right)^{3/2}}{9dx^3}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*e*n*Sqrt[d + e*x^2])/(3*d*x) - (b*n*(d + e*x^2)^(3/2))/(9*d*x^3) + (b*e
^(3/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d) - ((d + e*x^2)^(3/2)*(
a + b*Log[c*x^n]))/(3*d*x^3)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{x^4}\,dx = -\frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{3dx^3} + \frac{(bn)\int \frac{(d+ex^2)^{3/2}}{x^4}dx}{3d}$$
$$= -\frac{bn(d+ex^2)^{3/2}}{9dx^3} - \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{3dx^3} + \frac{(ben)\int \frac{\sqrt{d+ex^2}}{x^2}dx}{3d}$$
$$= -\frac{ben\sqrt{d+ex^2}}{3dx} - \frac{bn(d+ex^2)^{3/2}}{9dx^3} - \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{3dx^3} + \frac{(be^2n)\int}{3}$$
$$= -\frac{ben\sqrt{d+ex^2}}{3dx} - \frac{bn(d+ex^2)^{3/2}}{9dx^3} - \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{3dx^3} + \frac{(be^2n)\mathrm{Su}}{}$$
$$= -\frac{ben\sqrt{d+ex^2}}{3dx} - \frac{bn(d+ex^2)^{3/2}}{9dx^3} + \frac{be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d} - \frac{(d+ex^2)^{3/2}(a}{3dx}$$

Mathematica [A] time = 0.15, size = 99, normalized size = 0.88

$$-\frac{\sqrt{d+ex^2}\,\left(3a(d+ex^2)+bn(d+4ex^2)\right)+3b(d+ex^2)^{3/2}\log(cx^n)-3be^{3/2}nx^3\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{9dx^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -1/9*(Sqrt[d + e*x^2]*(3*a*(d + e*x^2) + b*n*(d + 4*e*x^2)) + 3*b*(d + e*x^
2)^(3/2)*Log[c*x^n] - 3*b*e^(3/2)*n*x^3*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])
/(d*x^3)
```

fricas [A] time = 0.48, size = 212, normalized size = 1.89

$$\left[\frac{3be^{\frac{3}{2}}nx^3\log\left(-2ex^2-2\sqrt{ex^2+d}\sqrt{e}x-d\right)-2\left(bdn+(4ben+3ae)x^2+3ad+3\left(bex^2+bd\right)\log(c)+3\left(benx^2\right.\right.}{18dx^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^4,x, algorithm="fricas")
```

```
[Out] [1/18*(3*b*e^(3/2)*n*x^3*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) -
2*(b*d*n + (4*b*e*n + 3*a*e)*x^2 + 3*a*d + 3*(b*e*x^2 + b*d)*log(c) + 3*(b*
e*n*x^2 + b*d*n)*log(x))*sqrt(e*x^2 + d))/(d*x^3), -1/9*(3*b*sqrt(-e)*e*n*x
^3*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (b*d*n + (4*b*e*n + 3*a*e)*x^2 + 3*
a*d + 3*(b*e*x^2 + b*d)*log(c) + 3*(b*e*n*x^2 + b*d*n)*log(x))*sqrt(e*x^2 +
 d))/(d*x^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ex^2+d}\,(b\log(cx^n)+a)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x^4, x)
```

maple [F] time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{\left(b \ln \left(c\,x^{n}\right)+a\right) \sqrt{e\,x^{2}+d}}{x^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x^4,x)
```

```
[Out] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x^4,x)
```

maxima [A] time = 0.61, size = 118, normalized size = 1.05

$$\frac{\left(\frac{3\,\sqrt{ex^2+d}\,e^2 x}{d}+3\,e^{\frac{3}{2}}\,\operatorname{arsinh}\left(\frac{ex}{\sqrt{de}}\right)-\frac{2\,\left(ex^2+d\right)^{\frac{3}{2}} e}{dx}-\frac{\left(ex^2+d\right)^{\frac{5}{2}}}{dx^3}\right)bn}{9\,d}-\frac{\left(ex^2+d\right)^{\frac{3}{2}} b \log\left(cx^n\right)}{3\,dx^3}-\frac{\left(ex^2+d\right)^{\frac{3}{2}} a}{3\,dx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^4,x, algorithm="maxima")
```

```
[Out] 1/9*(3*sqrt(e*x^2 + d)*e^2*x/d + 3*e^(3/2)*arcsinh(e*x/sqrt(d*e)) - 2*(e*x^
2 + d)^(3/2)*e/(d*x) - (e*x^2 + d)^(5/2)/(d*x^3))*b*n/d - 1/3*(e*x^2 + d)^(
3/2)*b*log(c*x^n)/(d*x^3) - 1/3*(e*x^2 + d)^(3/2)*a/(d*x^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{e\,x^2+d}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x^4,x)
```

```
[Out] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \log{\left(cx^{n} \right)}\right) \sqrt{d + ex^{2}}}{x^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x**4,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2)/x**4, x)
```

3.261 $\int \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{x^6}\,dx$

Optimal. Leaf size=170

$$\frac{2e\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{15d^2x^3}-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5}-\frac{2be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{15d^2}+\frac{2be^2n\sqrt{d+ex^2}}{15d^2x}-\frac{bn\left(d\right.}{2}$$

```
[Out] 2/45*b*e*n*(e*x^2+d)^(3/2)/d^2/x^3-1/25*b*n*(e*x^2+d)^(5/2)/d^2/x^5-2/15*b*
e^(5/2)*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/d^2-1/5*(e*x^2+d)^(3/2)*(a+b*l
n(c*x^n))/d/x^5+2/15*e*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/d^2/x^3+2/15*b*e^2*n
*(e*x^2+d)^(1/2)/d^2/x
```

Rubi [A] time = 0.15, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {271, 264, 2350, 12, 451, 277, 217, 206}

$$\frac{2e\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{15d^2x^3}-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5}+\frac{2be^2n\sqrt{d+ex^2}}{15d^2x}-\frac{2be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{15d^2}+\frac{2ben}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] (2*b*e^2*n*Sqrt[d + e*x^2])/(15*d^2*x) + (2*b*e*n*(d + e*x^2)^(3/2))/(45*d^
2*x^3) - (b*n*(d + e*x^2)^(5/2))/(25*d^2*x^5) - (2*b*e^(5/2)*n*ArcTanh[(Sqr
t[e]*x)/Sqrt[d + e*x^2]])/(15*d^2) - ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))
/(5*d*x^5) + (2*e*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(15*d^2*x^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x^6}\,dx = -\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5}+\frac{2e\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{15d^2x^3}-(bn)\int$$

$$= -\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5}+\frac{2e\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{15d^2x^3}-\frac{(bn)\int}{}$$

$$= -\frac{bn\left(d+ex^2\right)^{5/2}}{25d^2x^5}-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5}+\frac{2e\left(d+ex^2\right)^{3/2}\left(a+b\,\mathrm{lo}\right.}{15d^2x^3}$$

$$= \frac{2ben\left(d+ex^2\right)^{3/2}}{45d^2x^3}-\frac{bn\left(d+ex^2\right)^{5/2}}{25d^2x^5}-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5}+\frac{2e\left(\right.}{}$$

$$= \frac{2be^2n\sqrt{d+ex^2}}{15d^2x}+\frac{2ben\left(d+ex^2\right)^{3/2}}{45d^2x^3}-\frac{bn\left(d+ex^2\right)^{5/2}}{25d^2x^5}-\frac{\left(d+ex^2\right)^{3/2}\left(a+\right.}{5dx^5}$$

$$= \frac{2be^2n\sqrt{d+ex^2}}{15d^2x}+\frac{2ben\left(d+ex^2\right)^{3/2}}{45d^2x^3}-\frac{bn\left(d+ex^2\right)^{5/2}}{25d^2x^5}-\frac{\left(d+ex^2\right)^{3/2}\left(a+\right.}{5dx^5}$$

$$= \frac{2be^2n\sqrt{d+ex^2}}{15d^2x}+\frac{2ben\left(d+ex^2\right)^{3/2}}{45d^2x^3}-\frac{bn\left(d+ex^2\right)^{5/2}}{25d^2x^5}-\frac{2be^{5/2}n\tanh^{-1}\left(\right.}{15d^2}$$

Mathematica [A] time = 0.20, size = 145, normalized size = 0.85

$$-\frac{\sqrt{d+ex^2}\left(15a\left(3d^2+dex^2-2e^2x^4\right)+bn\left(9d^2+8dex^2-31e^2x^4\right)\right)+15b\sqrt{d+ex^2}\left(3d^2+dex^2-2e^2x^4\right)\log\left(\right.}{225d^2x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -1/225*(Sqrt[d + e*x^2]*(b*n*(9*d^2 + 8*d*e*x^2 - 31*e^2*x^4) + 15*a*(3*d^2
 + d*e*x^2 - 2*e^2*x^4)) + 15*b*Sqrt[d + e*x^2]*(3*d^2 + d*e*x^2 - 2*e^2*x^
4)*Log[c*x^n] + 30*b*e^(5/2)*n*x^5*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(d^2
*x^5)
```

fricas [A] time = 0.49, size = 323, normalized size = 1.90

$$\left[\frac{15\,be^{\frac{5}{2}}nx^5\log\left(-2\,ex^2+2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)+\left(\left(31\,be^2n+30\,ae^2\right)x^4-9\,bd^2n-45\,ad^2-(8\,bden+15\,ade)x^2+\right.}{225\,d^2x^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^6,x, algorithm="fricas")
```

```
[Out] [1/225*(15*b*e^(5/2)*n*x^5*log(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d)
+ ((31*b*e^2*n + 30*a*e^2)*x^4 - 9*b*d^2*n - 45*a*d^2 - (8*b*d*e*n + 15*a*d
*e)*x^2 + 15*(2*b*e^2*x^4 - b*d*e*x^2 - 3*b*d^2)*log(c) + 15*(2*b*e^2*n*x^4
 - b*d*e*n*x^2 - 3*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^2*x^5), 1/225*(30*b
*sqrt(-e)*e^2*n*x^5*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + ((31*b*e^2*n + 30*
a*e^2)*x^4 - 9*b*d^2*n - 45*a*d^2 - (8*b*d*e*n + 15*a*d*e)*x^2 + 15*(2*b*e^
2*x^4 - b*d*e*x^2 - 3*b*d^2)*log(c) + 15*(2*b*e^2*n*x^4 - b*d*e*n*x^2 - 3*b
*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^2*x^5)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ex^2+d}\left(b\log\left(cx^n\right)+a\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^6,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x^6, x)
```

maple [F] time = 0.45, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{e\,x^2+d}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x^6,x)
```

```
[Out] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x^6,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{15}\,a\left(\frac{2\left(ex^2+d\right)^{\frac{3}{2}}e}{d^2x^3}-\frac{3\left(ex^2+d\right)^{\frac{3}{2}}}{dx^5}\right)+b\int \frac{\sqrt{ex^2+d}\left(\log(c)+\log\left(x^n\right)\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^6,x, algorithm="maxima")
```

```
[Out] 1/15*a*(2*(e*x^2 + d)^(3/2)*e/(d^2*x^3) - 3*(e*x^2 + d)^(3/2)/(d*x^5)) + b*
integrate(sqrt(e*x^2 + d)*(log(c) + log(x^n))/x^6, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{e\,x^2+d}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x^6,x)
[Out] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x^6, x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\log(cx^n))\sqrt{d + ex^2}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x**6,x)
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2)/x**6, x)
```

3.262 $\int \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{x^8}\,dx$

Optimal. Leaf size=230

$$-\frac{8e^2\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{105d^3x^3}+\frac{4e\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{35d^2x^5}-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7}+\frac{8be^{7/2}n\tanh}{105}$$

```
[Out] -1/49*b*n*(e*x^2+d)^(3/2)/d/x^7+13/1225*b*e*n*(e*x^2+d)^(3/2)/d^2/x^5+62/11
025*b*e^2*n*(e*x^2+d)^(3/2)/d^3/x^3+8/105*b*e^(7/2)*n*arctanh(x*e^(1/2)/(e*
x^2+d)^(1/2))/d^3-1/7*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/d/x^7+4/35*e*(e*x^2+d
)^(3/2)*(a+b*ln(c*x^n))/d^2/x^5-8/105*e^2*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/d
^3/x^3-8/105*b*e^3*n*(e*x^2+d)^(1/2)/d^3/x
```

Rubi [A] time = 0.20, antiderivative size = 230, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {271, 264, 2350, 12, 1265, 451, 277, 217, 206}

$$-\frac{8e^2\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{105d^3x^3}+\frac{4e\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{35d^2x^5}-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7}-\frac{8be^3n\sqrt{d+e}}{105d^3x}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] (-8*b*e^3*n*Sqrt[d + e*x^2])/(105*d^3*x) - (8*b*e^2*n*(d + e*x^2)^(3/2))/(3
15*d^3*x^3) - (b*n*(d + e*x^2)^(5/2))/(49*d^2*x^7) + (38*b*e*n*(d + e*x^2)^
(5/2))/(1225*d^3*x^5) + (8*b*e^(7/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]]
)/(105*d^3) - ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(7*d*x^7) + (4*e*(d +
e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(35*d^2*x^5) - (8*e^2*(d + e*x^2)^(3/2)*(a
 + b*Log[c*x^n]))/(105*d^3*x^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
```

```
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x^8}\,dx = -\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7} + \frac{4e\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{35d^2x^5} - \frac{8e^2\left(d+e\right.}{}$$

$$= -\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7} + \frac{4e\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{35d^2x^5} - \frac{8e^2\left(d+e\right.}{}$$

$$= -\frac{bn\left(d+ex^2\right)^{5/2}}{49d^2x^7} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7} + \frac{4e\left(d+ex^2\right)^{3/2}\left(a+b\log\right.}{35d^2x^5}$$

$$= -\frac{bn\left(d+ex^2\right)^{5/2}}{49d^2x^7} + \frac{38ben\left(d+ex^2\right)^{5/2}}{1225d^3x^5} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7} + \frac{4e\left(d\right.}{}$$

$$= -\frac{8be^2n\left(d+ex^2\right)^{3/2}}{315d^3x^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{49d^2x^7} + \frac{38ben\left(d+ex^2\right)^{5/2}}{1225d^3x^5} - \frac{\left(d+ex^2\right)^{3/2}\left(a\right.}{7dx}$$

$$= -\frac{8be^3n\sqrt{d+ex^2}}{105d^3x} - \frac{8be^2n\left(d+ex^2\right)^{3/2}}{315d^3x^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{49d^2x^7} + \frac{38ben\left(d+ex^2\right)^{5/2}}{1225d^3x^5}$$

$$= -\frac{8be^3n\sqrt{d+ex^2}}{105d^3x} - \frac{8be^2n\left(d+ex^2\right)^{3/2}}{315d^3x^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{49d^2x^7} + \frac{38ben\left(d+ex^2\right)^{5/2}}{1225d^3x^5}$$

$$= -\frac{8be^3n\sqrt{d+ex^2}}{105d^3x} - \frac{8be^2n\left(d+ex^2\right)^{3/2}}{315d^3x^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{49d^2x^7} + \frac{38ben\left(d+ex^2\right)^{5/2}}{1225d^3x^5}$$

Mathematica [A] time = 0.24, size = 180, normalized size = 0.78

$$-\frac{\sqrt{d+ex^2}\left(105a\left(15d^3+3d^2ex^2-4de^2x^4+8e^3x^6\right)+bn\left(225d^3+108d^2ex^2-179de^2x^4+778e^3x^6\right)\right)+105b\sqrt{d+}}{11025d^3x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -1/11025*(Sqrt[d + e*x^2]*(105*a*(15*d^3 + 3*d^2*e*x^2 - 4*d*e^2*x^4 + 8*e^
3*x^6) + b*n*(225*d^3 + 108*d^2*e*x^2 - 179*d*e^2*x^4 + 778*e^3*x^6)) + 105
*b*Sqrt[d + e*x^2]*(15*d^3 + 3*d^2*e*x^2 - 4*d*e^2*x^4 + 8*e^3*x^6)*Log[c*x
^n] - 840*b*e^(7/2)*n*x^7*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(d^3*x^7)
```

fricas [A] time = 0.54, size = 426, normalized size = 1.85

$$\left[\frac{420\,be^{\frac{7}{2}}nx^7\log\left(-2\,ex^2-2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)-\left(2\left(389\,be^3n+420\,ae^3\right)x^6+225\,bd^3n-\left(179\,bde^2n+420\,ade^2\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^8,x, algorithm="fricas")
```

```
[Out] [1/11025*(420*b*e^(7/2)*n*x^7*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x -
d) - (2*(389*b*e^3*n + 420*a*e^3)*x^6 + 225*b*d^3*n - (179*b*d*e^2*n + 420*
a*d*e^2)*x^4 + 1575*a*d^3 + 9*(12*b*d^2*e*n + 35*a*d^2*e)*x^2 + 105*(8*b*e^
3*x^6 - 4*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + 15*b*d^3)*log(c) + 105*(8*b*e^3*n*x
^6 - 4*b*d*e^2*n*x^4 + 3*b*d^2*e*n*x^2 + 15*b*d^3*n)*log(x))*sqrt(e*x^2 + d
))/(d^3*x^7), -1/11025*(840*b*sqrt(-e)*e^3*n*x^7*arctan(sqrt(-e)*x/sqrt(e*x
^2 + d)) + (2*(389*b*e^3*n + 420*a*e^3)*x^6 + 225*b*d^3*n - (179*b*d*e^2*n
+ 420*a*d*e^2)*x^4 + 1575*a*d^3 + 9*(12*b*d^2*e*n + 35*a*d^2*e)*x^2 + 105*(
8*b*e^3*x^6 - 4*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + 15*b*d^3)*log(c) + 105*(8*b*e
```

```
^3*n*x^6 - 4*b*d*e^2*n*x^4 + 3*b*d^2*e*n*x^2 + 15*b*d^3*n)*log(x))*sqrt(e*x
^2 + d))/(d^3*x^7)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ex^2+d}\left(b\log\left(cx^n\right)+a\right)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^8,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x^8, x)
```

maple [F] time = 0.46, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)\sqrt{e\,x^2+d}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x^8,x)
```

```
[Out] int((b*ln(c*x^n)+a)*(e*x^2+d)^(1/2)/x^8,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{105}a\left(\frac{8\left(ex^2+d\right)^{\frac{3}{2}}e^2}{d^3x^3}-\frac{12\left(ex^2+d\right)^{\frac{3}{2}}e}{d^2x^5}+\frac{15\left(ex^2+d\right)^{\frac{3}{2}}}{dx^7}\right)+b\int \frac{\sqrt{ex^2+d}\left(\log(c)+\log\left(x^n\right)\right)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^8,x, algorithm="maxima")
```

```
[Out] -1/105*a*(8*(e*x^2 + d)^(3/2)*e^2/(d^3*x^3) - 12*(e*x^2 + d)^(3/2)*e/(d^2*x
^5) + 15*(e*x^2 + d)^(3/2)/(d*x^7)) + b*integrate(sqrt(e*x^2 + d)*(log(c) +
 log(x^n))/x^8, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{e\,x^2+d}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x^8,x)
```

```
[Out] int(((d + e*x^2)^(1/2)*(a + b*log(c*x^n)))/x^8, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)\sqrt{d+ex^2}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x**8,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2)/x**8, x)
```

3.263 $\int x^5 (d+ex^2)^{3/2} (a+b\log(cx^n))\,dx$

Optimal. Leaf size=231

$$\frac{d^2 (d+ex^2)^{5/2} (a+b\log(cx^n))}{5e^3} - \frac{2d (d+ex^2)^{7/2} (a+b\log(cx^n))}{7e^3} + \frac{(d+ex^2)^{9/2} (a+b\log(cx^n))}{9e^3} + \frac{8bd^{9/2}n \tanh^{-1}}{315e^3}$$

```
[Out] -8/945*b*d^3*n*(e*x^2+d)^(3/2)/e^3-8/1575*b*d^2*n*(e*x^2+d)^(5/2)/e^3+11/44
1*b*d*n*(e*x^2+d)^(7/2)/e^3-1/81*b*n*(e*x^2+d)^(9/2)/e^3+8/315*b*d^(9/2)*n*
arctanh((e*x^2+d)^(1/2)/d^(1/2))/e^3+1/5*d^2*(e*x^2+d)^(5/2)*(a+b*ln(c*x^n)
)/e^3-2/7*d*(e*x^2+d)^(7/2)*(a+b*ln(c*x^n))/e^3+1/9*(e*x^2+d)^(9/2)*(a+b*ln
(c*x^n))/e^3-8/315*b*d^4*n*(e*x^2+d)^(1/2)/e^3
```

Rubi [A] time = 0.28, antiderivative size = 231, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {266, 43, 2350, 12, 1251, 897, 1261, 208}

$$\frac{d^2 (d+ex^2)^{5/2} (a+b\log(cx^n))}{5e^3} - \frac{2d (d+ex^2)^{7/2} (a+b\log(cx^n))}{7e^3} + \frac{(d+ex^2)^{9/2} (a+b\log(cx^n))}{9e^3} - \frac{8bd^4 n\sqrt{d+ex^2}}{315e^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-8*b*d^4*n*Sqrt[d + e*x^2])/(315*e^3) - (8*b*d^3*n*(d + e*x^2)^(3/2))/(945
*e^3) - (8*b*d^2*n*(d + e*x^2)^(5/2))/(1575*e^3) + (11*b*d*n*(d + e*x^2)^(7
/2))/(441*e^3) - (b*n*(d + e*x^2)^(9/2))/(81*e^3) + (8*b*d^(9/2)*n*ArcTanh[
Sqrt[d + e*x^2]/Sqrt[d]])/(315*e^3) + (d^2*(d + e*x^2)^(5/2)*(a + b*Log[c*x
^n]))/(5*e^3) - (2*d*(d + e*x^2)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3) + ((d +
e*x^2)^(9/2)*(a + b*Log[c*x^n]))/(9*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
```

```
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int x^5 \left(d+ex^2\right)^{3/2} \left(a+b\log\left(cx^n\right)\right)\,dx = \frac{d^2\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} - \frac{2d\left(d+ex^2\right)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3} +$$

$$= \frac{d^2\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} - \frac{2d\left(d+ex^2\right)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3} +$$

$$= \frac{d^2\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} - \frac{2d\left(d+ex^2\right)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3} +$$

$$= \frac{d^2\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} - \frac{2d\left(d+ex^2\right)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3} +$$

$$= \frac{d^2\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^3} - \frac{2d\left(d+ex^2\right)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^3} +$$

$$= -\frac{8bd^4n\sqrt{d+ex^2}}{315e^3} - \frac{8bd^3n\left(d+ex^2\right)^{3/2}}{945e^3} - \frac{8bd^2n\left(d+ex^2\right)^{5/2}}{1575e^3} + \frac{11bdn}{}$$

$$= -\frac{8bd^4n\sqrt{d+ex^2}}{315e^3} - \frac{8bd^3n\left(d+ex^2\right)^{3/2}}{945e^3} - \frac{8bd^2n\left(d+ex^2\right)^{5/2}}{1575e^3} + \frac{11bdn}{}$$

Mathematica [A] time = 0.36, size = 256, normalized size = 1.11

$$\sqrt{d+ex^2}\left(2d^4\left(1260a+1260b\left(\log\left(cx^n\right)-n\log(x)\right)-1307bn\right)-d^3ex^2\left(1260a+1260b\left(\log\left(cx^n\right)-n\log(x)\right)-\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-2520*b*d^(9/2)*n*Log[x] + 315*b*n*(d + e*x^2)^(5/2)*(8*d^2 - 20*d*e*x^2 +
 35*e^2*x^4)*Log[x] + Sqrt[d + e*x^2]*(1225*e^4*x^8*(9*a - b*n - 9*b*n*Log[
x] + 9*b*Log[c*x^n]) + 3*d^2*e^2*x^4*(315*a - 143*b*n + 315*b*(-(n*Log[x])
+ Log[c*x^n])) + 25*d*e^3*x^6*(630*a - 97*b*n + 630*b*(-(n*Log[x]) + Log[c*
x^n])) + 2*d^4*(1260*a - 1307*b*n + 1260*b*(-(n*Log[x]) + Log[c*x^n])) - d^
3*e*x^2*(1260*a - 677*b*n + 1260*b*(-(n*Log[x]) + Log[c*x^n]))) + 2520*b*d^
(9/2)*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(99225*e^3)
```

fricas [A] time = 0.53, size = 514, normalized size = 2.23

$$\left[\frac{1260\,bd^{\frac{9}{2}}n\log\left(-\frac{ex^2+2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right)-\left(1225\left(be^4n-9\,ae^4\right)x^8+25\left(97\,bde^3n-630\,ade^3\right)x^6+2614\,bd^4n-2520\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [1/99225*(1260*b*d^(9/2)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x
^2) - (1225*(b*e^4*n - 9*a*e^4)*x^8 + 25*(97*b*d*e^3*n - 630*a*d*e^3)*x^6 +
 2614*b*d^4*n - 2520*a*d^4 + 3*(143*b*d^2*e^2*n - 315*a*d^2*e^2)*x^4 - (677
*b*d^3*e*n - 1260*a*d^3*e)*x^2 - 315*(35*b*e^4*x^8 + 50*b*d*e^3*x^6 + 3*b*d
^2*e^2*x^4 - 4*b*d^3*e*x^2 + 8*b*d^4)*log(c) - 315*(35*b*e^4*n*x^8 + 50*b*d
*e^3*n*x^6 + 3*b*d^2*e^2*n*x^4 - 4*b*d^3*e*n*x^2 + 8*b*d^4*n)*log(x))*sqrt(
e*x^2 + d))/e^3, -1/99225*(2520*b*sqrt(-d)*d^4*n*arctan(sqrt(-d)/sqrt(e*x^2
 + d)) + (1225*(b*e^4*n - 9*a*e^4)*x^8 + 25*(97*b*d*e^3*n - 630*a*d*e^3)*x^
6 + 2614*b*d^4*n - 2520*a*d^4 + 3*(143*b*d^2*e^2*n - 315*a*d^2*e^2)*x^4 - (
677*b*d^3*e*n - 1260*a*d^3*e)*x^2 - 315*(35*b*e^4*x^8 + 50*b*d*e^3*x^6 + 3*
b*d^2*e^2*x^4 - 4*b*d^3*e*x^2 + 8*b*d^4)*log(c) - 315*(35*b*e^4*n*x^8 + 50*
b*d*e^3*n*x^6 + 3*b*d^2*e^2*n*x^4 - 4*b*d^3*e*n*x^2 + 8*b*d^4*n)*log(x))*sq
rt(e*x^2 + d))/e^3]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)*x^5, x)
```

maple [F] time = 0.39, size = 0, normalized size = 0.00

$$\int\left(e\,x^2+d\right)^{\frac{3}{2}}\left(b\ln\left(c\,x^n\right)+a\right)x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(e*x^2+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

```
[Out] int(x^5*(e*x^2+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

maxima [A] time = 1.45, size = 234, normalized size = 1.01

$$-\frac{1}{99225}\left(\frac{1260\,d^{\frac{9}{2}}\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{e^3}+\frac{1225\left(ex^2+d\right)^{\frac{9}{2}}-2475\left(ex^2+d\right)^{\frac{7}{2}}d+504\left(ex^2+d\right)^{\frac{5}{2}}d^2+840\left(ex^2+d\right)}{e^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/99225*(1260*d^(9/2)*log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + s
qrt(d)))/e^3 + (1225*(e*x^2 + d)^(9/2) - 2475*(e*x^2 + d)^(7/2)*d + 504*(e*
x^2 + d)^(5/2)*d^2 + 840*(e*x^2 + d)^(3/2)*d^3 + 2520*sqrt(e*x^2 + d)*d^4)/
e^3)*b*n + 1/315*(35*(e*x^2 + d)^(5/2)*x^4/e - 20*(e*x^2 + d)^(5/2)*d*x^2/e
^2 + 8*(e*x^2 + d)^(5/2)*d^2/e^3)*b*log(c*x^n) + 1/315*(35*(e*x^2 + d)^(5/2
)*x^4/e - 20*(e*x^2 + d)^(5/2)*d*x^2/e^2 + 8*(e*x^2 + d)^(5/2)*d^2/e^3)*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^5\left(e\,x^2+d\right)^{3/2}\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d + e*x^2)^(3/2)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^5*(d + e*x^2)^(3/2)*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(e*x**2+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.264 $\int x^3 \left(d + ex^2\right)^{3/2} \left(a + b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=177

$$-\frac{d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}+\frac{\left(d+ex^2\right)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^2}-\frac{2bd^{7/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{35e^2}+\frac{2bd^3n\sqrt{d+ex^2}}{35e^2}+\frac{2bd}{}$$

```
[Out] 2/105*b*d^2*n*(e*x^2+d)^(3/2)/e^2+2/175*b*d*n*(e*x^2+d)^(5/2)/e^2-1/49*b*n*
(e*x^2+d)^(7/2)/e^2-2/35*b*d^(7/2)*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/e^2-1
/5*d*(e*x^2+d)^(5/2)*(a+b*ln(c*x^n))/e^2+1/7*(e*x^2+d)^(7/2)*(a+b*ln(c*x^n)
)/e^2+2/35*b*d^3*n*(e*x^2+d)^(1/2)/e^2
```

Rubi [A] time = 0.20, antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 43, 2350, 12, 446, 80, 50, 63, 208}

$$-\frac{d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2}+\frac{\left(d+ex^2\right)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^2}+\frac{2bd^3n\sqrt{d+ex^2}}{35e^2}+\frac{2bd^2n\left(d+ex^2\right)^{3/2}}{105e^2}-\frac{2bd^{7/2}n\,\text{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*b*d^3*n*Sqrt[d + e*x^2])/(35*e^2) + (2*b*d^2*n*(d + e*x^2)^(3/2))/(105*e
^2) + (2*b*d*n*(d + e*x^2)^(5/2))/(175*e^2) - (b*n*(d + e*x^2)^(7/2))/(49*e
^2) - (2*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(35*e^2) - (d*(d + e
*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e^2) + ((d + e*x^2)^(7/2)*(a + b*Log[c*x
^n]))/(7*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int x^3 \left(d+ex^2\right)^{3/2} \left(a+b\log\left(cx^n\right)\right) dx = -\frac{d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2} + \frac{\left(d+ex^2\right)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^2} - (bn)$$

$$= -\frac{d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2} + \frac{\left(d+ex^2\right)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^2} - \frac{(bn)}{}$$

$$= -\frac{d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2} + \frac{\left(d+ex^2\right)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^2} - \frac{(bn)}{}$$

$$= -\frac{bn\left(d+ex^2\right)^{7/2}}{49e^2} - \frac{d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2} + \frac{\left(d+ex^2\right)^{7/2}\left(a+b\right.}{7e^2}$$

$$= \frac{2bdn\left(d+ex^2\right)^{5/2}}{175e^2} - \frac{bn\left(d+ex^2\right)^{7/2}}{49e^2} - \frac{d\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^2} +$$

$$= \frac{2bd^2n\left(d+ex^2\right)^{3/2}}{105e^2} + \frac{2bdn\left(d+ex^2\right)^{5/2}}{175e^2} - \frac{bn\left(d+ex^2\right)^{7/2}}{49e^2} - \frac{d\left(d+ex^2\right)^{5/2}}{}$$

$$= \frac{2bd^3n\sqrt{d+ex^2}}{35e^2} + \frac{2bd^2n\left(d+ex^2\right)^{3/2}}{105e^2} + \frac{2bdn\left(d+ex^2\right)^{5/2}}{175e^2} - \frac{bn\left(d+ex^2\right.}{49e^2}$$

$$= \frac{2bd^3n\sqrt{d+ex^2}}{35e^2} + \frac{2bd^2n\left(d+ex^2\right)^{3/2}}{105e^2} + \frac{2bdn\left(d+ex^2\right)^{5/2}}{175e^2} - \frac{bn\left(d+ex^2\right.}{49e^2}$$

$$= \frac{2bd^3n\sqrt{d+ex^2}}{35e^2} + \frac{2bd^2n\left(d+ex^2\right)^{3/2}}{105e^2} + \frac{2bdn\left(d+ex^2\right)^{5/2}}{175e^2} - \frac{bn\left(d+ex^2\right.}{49e^2}$$

Mathematica [A] time = 0.21, size = 227, normalized size = 1.28

$$\sqrt{d+ex^2}\left(-\frac{d^3\left(210a+210b\left(\log\left(cx^n\right)-n\log(x)\right)-247bn\right)}{3675e^2} + \frac{d^2x^2\left(105a+105b\left(\log\left(cx^n\right)-n\log(x)\right)-71bn\right)}{3675e}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*b*d^(7/2)*n*Log[x])/(35*e^2) - (b*n*(2*d - 5*e*x^2)*(d + e*x^2)^(5/2)*Lo
g[x])/(35*e^2) + Sqrt[d + e*x^2]*((e*x^6*(7*a - b*n + 7*b*(-(n*Log[x]) + Lo
g[c*x^n])))/49 + (d^2*x^2*(105*a - 71*b*n + 105*b*(-(n*Log[x]) + Log[c*x^n]
)))/(3675*e) - (d^3*(210*a - 247*b*n + 210*b*(-(n*Log[x]) + Log[c*x^n])))/(
3675*e^2) + (d*x^4*(280*a - 61*b*n + 280*b*(-(n*Log[x]) + Log[c*x^n])))/122
5) - (2*b*d^(7/2)*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(35*e^2)
```

fricas [A] time = 0.50, size = 409, normalized size = 2.31

$$\left[\frac{105\,bd^{\frac{7}{2}}n\log\left(-\frac{ex^2-2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right) - \left(75\left(be^3n-7\,ae^3\right)x^6 - 247\,bd^3n + 3\left(61\,bde^2n-280\,ade^2\right)x^4 + 210\,ad^3 + \right(}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [1/3675*(105*b*d^(7/2)*n*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2
) - (75*(b*e^3*n - 7*a*e^3)*x^6 - 247*b*d^3*n + 3*(61*b*d*e^2*n - 280*a*d*e
```

```
^2)*x^4 + 210*a*d^3 + (71*b*d^2*e*n - 105*a*d^2*e)*x^2 - 105*(5*b*e^3*x^6 +
 8*b*d*e^2*x^4 + b*d^2*e*x^2 - 2*b*d^3)*log(c) - 105*(5*b*e^3*n*x^6 + 8*b*d
*e^2*n*x^4 + b*d^2*e*n*x^2 - 2*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/e^2, 1/367
5*(210*b*sqrt(-d)*d^3*n*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - (75*(b*e^3*n - 7
*a*e^3)*x^6 - 247*b*d^3*n + 3*(61*b*d*e^2*n - 280*a*d*e^2)*x^4 + 210*a*d^3
+ (71*b*d^2*e*n - 105*a*d^2*e)*x^2 - 105*(5*b*e^3*x^6 + 8*b*d*e^2*x^4 + b*d
^2*e*x^2 - 2*b*d^3)*log(c) - 105*(5*b*e^3*n*x^6 + 8*b*d*e^2*n*x^4 + b*d^2*e
*n*x^2 - 2*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/e^2]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)*x^3, x)
```

maple [F] time = 0.38, size = 0, normalized size = 0.00

$$\int \left(e\,x^2+d\right)^{\frac{3}{2}}\left(b\ln\left(c\,x^n\right)+a\right)x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

```
[Out] int(x^3*(e*x^2+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

maxima [A] time = 1.33, size = 181, normalized size = 1.02

$$\frac{1}{3675}\left(\frac{105\,d^{\frac{7}{2}}\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{e^2}-\frac{75\left(ex^2+d\right)^{\frac{7}{2}}-42\left(ex^2+d\right)^{\frac{5}{2}}d-70\left(ex^2+d\right)^{\frac{3}{2}}d^2-210\sqrt{ex^2+d}\,d^3}{e^2}\right)bn+\frac{1}{35}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] 1/3675*(105*d^(7/2)*log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + sqrt
(d)))/e^2 - (75*(e*x^2 + d)^(7/2) - 42*(e*x^2 + d)^(5/2)*d - 70*(e*x^2 + d)
^(3/2)*d^2 - 210*sqrt(e*x^2 + d)*d^3)/e^2)*b*n + 1/35*(5*(e*x^2 + d)^(5/2)*
x^2/e - 2*(e*x^2 + d)^(5/2)*d/e^2)*b*log(c*x^n) + 1/35*(5*(e*x^2 + d)^(5/2)
*x^2/e - 2*(e*x^2 + d)^(5/2)*d/e^2)*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^3\left(e\,x^2+d\right)^{3/2}\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d + e*x^2)^(3/2)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^3*(d + e*x^2)^(3/2)*(a + b*log(c*x^n)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^3\left(a+b\log\left(cx^n\right)\right)\left(d+ex^2\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))*(d + e*x**2)**(3/2), x)
```

3.265 $\int x\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=125

$$\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}+\frac{bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{5e}-\frac{bd^2n\sqrt{d+ex^2}}{5e}-\frac{bdn\left(d+ex^2\right)^{3/2}}{15e}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e}$$

```
[Out] -1/15*b*d*n*(e*x^2+d)^(3/2)/e-1/25*b*n*(e*x^2+d)^(5/2)/e+1/5*b*d^(5/2)*n*ar
ctanh((e*x^2+d)^(1/2)/d^(1/2))/e+1/5*(e*x^2+d)^(5/2)*(a+b*ln(c*x^n))/e-1/5*
b*d^2*n*(e*x^2+d)^(1/2)/e
```

Rubi [A] time = 0.11, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {2338, 266, 50, 63, 208}

$$\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}-\frac{bd^2n\sqrt{d+ex^2}}{5e}+\frac{bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{5e}-\frac{bdn\left(d+ex^2\right)^{3/2}}{15e}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*Sqrt[d + e*x^2])/(5*e) - (b*d*n*(d + e*x^2)^(3/2))/(15*e) - (b*n*
(d + e*x^2)^(5/2))/(25*e) + (b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/
(5*e) + ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e)
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
```

```
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)dx=\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}-\frac{(bn)\int\frac{\left(d+ex^2\right)^{5/2}}{x}dx}{5e}$$
$$=\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}-\frac{(bn)\,\mathrm{Subst}\left(\int\frac{(d+ex)^{5/2}}{x}dx,x,x^2\right)}{10e}$$
$$=-\frac{bn\left(d+ex^2\right)^{5/2}}{25e}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}-\frac{(bdn)\,\mathrm{Subst}\left(\int\frac{(d+ex)^{3/}}{x}\right.}{10e}$$
$$=-\frac{bdn\left(d+ex^2\right)^{3/2}}{15e}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}-\frac{(bc}{}$$
$$=-\frac{bd^2n\sqrt{d+ex^2}}{5e}-\frac{bdn\left(d+ex^2\right)^{3/2}}{15e}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e}+\frac{\left(d+ex^2\right)^{5/2}\left(a+\right.}{5e}$$
$$=-\frac{bd^2n\sqrt{d+ex^2}}{5e}-\frac{bdn\left(d+ex^2\right)^{3/2}}{15e}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e}+\frac{\left(d+ex^2\right)^{5/2}\left(a+\right.}{5e}$$
$$=-\frac{bd^2n\sqrt{d+ex^2}}{5e}-\frac{bdn\left(d+ex^2\right)^{3/2}}{15e}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e}+\frac{bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{}}{}\right.}{5e}$$

Mathematica [A] time = 0.15, size = 181, normalized size = 1.45

$$\sqrt{d+ex^2}\left(\frac{d^2\left(15a+15b\left(\log\left(cx^n\right)-n\log(x)\right)-23bn\right)}{75e}+\frac{1}{75}dx^2\left(30a+30b\left(\log\left(cx^n\right)-n\log(x)\right)-11bn\right)+\frac{1}{25}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -1/5*(b*d^(5/2)*n*Log[x])/e + (b*n*(d + e*x^2)^(5/2)*Log[x])/(5*e) + Sqrt[d
 + e*x^2]*((e*x^4*(5*a - b*n + 5*b*(-(n*Log[x]) + Log[c*x^n])))/25 + (d^2*(
15*a - 23*b*n + 15*b*(-(n*Log[x]) + Log[c*x^n])))/(75*e) + (d*x^2*(30*a - 1
1*b*n + 30*b*(-(n*Log[x]) + Log[c*x^n])))/75) + (b*d^(5/2)*n*Log[d + Sqrt[d
]*Sqrt[d + e*x^2]])/(5*e)
```

fricas [A] time = 0.47, size = 304, normalized size = 2.43

$$\left[\frac{15\,bd^{\frac{5}{2}}n\log\left(-\frac{ex^2+2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right)-2\left(3\left(be^2n-5\,ae^2\right)x^4+23\,bd^2n-15\,ad^2+(11\,bden-30\,ade)x^2-15\left(be^2x^4\right.\right.}{150\,e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [1/150*(15*b*d^(5/2)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2)
- 2*(3*(b*e^2*n - 5*a*e^2)*x^4 + 23*b*d^2*n - 15*a*d^2 + (11*b*d*e*n - 30*a
```

```
*d*e)*x^2 - 15*(b*e^2*x^4 + 2*b*d*e*x^2 + b*d^2)*log(c) - 15*(b*e^2*n*x^4 +
 2*b*d*e*n*x^2 + b*d^2*n)*log(x))*sqrt(e*x^2 + d))/e, -1/75*(15*b*sqrt(-d)*
d^2*n*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (3*(b*e^2*n - 5*a*e^2)*x^4 + 23*b*
d^2*n - 15*a*d^2 + (11*b*d*e*n - 30*a*d*e)*x^2 - 15*(b*e^2*x^4 + 2*b*d*e*x^
2 + b*d^2)*log(c) - 15*(b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*log(x))*sqrt
(e*x^2 + d))/e]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)*x, x)
```

maple [F] time = 0.37, size = 0, normalized size = 0.00

$$\int \left(e\,x^2+d\right)^{\frac{3}{2}}\left(b\ln\left(c\,x^n\right)+a\right)x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

```
[Out] int(x*(e*x^2+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

maxima [A] time = 0.67, size = 99, normalized size = 0.79

$$\frac{\left(ex^2+d\right)^{\frac{5}{2}}b\log\left(cx^n\right)}{5\,e}+\frac{\left(ex^2+d\right)^{\frac{5}{2}}a}{5\,e}+\frac{\left(15\,d^{\frac{5}{2}}\operatorname{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)-3\left(ex^2+d\right)^{\frac{5}{2}}-5\left(ex^2+d\right)^{\frac{3}{2}}d-15\sqrt{ex^2+d}\,d^2\right)b}{75\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] 1/5*(e*x^2 + d)^(5/2)*b*log(c*x^n)/e + 1/5*(e*x^2 + d)^(5/2)*a/e + 1/75*(15
*d^(5/2)*arcsinh(d/(sqrt(d*e)*abs(x))) - 3*(e*x^2 + d)^(5/2) - 5*(e*x^2 + d
)^(3/2)*d - 15*sqrt(e*x^2 + d)*d^2)*b*n/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\left(e\,x^2+d\right)^{3/2}\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d + e*x^2)^(3/2)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x*(d + e*x^2)^(3/2)*(a + b*log(c*x^n)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x\left(a+b\log\left(cx^n\right)\right)\left(d+ex^2\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Integral(x*(a + b*log(c*x**n))*(d + e*x**2)**(3/2), x)
```

3.266 $\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}\,dx$

Optimal. Leaf size=260

$$\frac{1}{3}\left(-3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^{3/2}n\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^2+d}}\right)$$

```
[Out] -1/9*b*n*(e*x^2+d)^(3/2)+4/3*b*d^(3/2)*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))+1
/2*b*d^(3/2)*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))^2-b*d^(3/2)*n*arctanh((e*x^
2+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(1/2)-(e*x^2+d)^(1/2)))-1/2*b*d^(3/2)*n
*polylog(2,1-2*d^(1/2)/(d^(1/2)-(e*x^2+d)^(1/2)))-4/3*b*d*n*(e*x^2+d)^(1/2)
+1/3*(a+b*ln(c*x^n))*((e*x^2+d)^(3/2)-3*d^(3/2)*arctanh((e*x^2+d)^(1/2)/d^(
1/2))+3*d*(e*x^2+d)^(1/2))
```

Rubi [A] time = 0.39, antiderivative size = 260, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 50, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{1}{2}bd^{3/2}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)+\frac{1}{3}\left(-3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}\right)\left(a+b1\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-4*b*d*n*Sqrt[d + e*x^2])/3 - (b*n*(d + e*x^2)^(3/2))/9 + (4*b*d^(3/2)*n*A
rcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/3 + (b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/S
qrt[d]]^2)/2 + ((3*d*Sqrt[d + e*x^2] + (d + e*x^2)^(3/2) - 3*d^(3/2)*ArcTan
h[Sqrt[d + e*x^2]/Sqrt[d]])*(a + b*Log[c*x^n]))/3 - b*d^(3/2)*n*ArcTanh[Sqr
t[d + e*x^2]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])] - (b*d^(
3/2)*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/2
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}\,dx = \frac{1}{3}\left(3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}-3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)\left(a+b\log\left(cx^n\right)\right)$$

$$= \frac{1}{3}\left(3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}-3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)\left(a+b\log\left(cx^n\right)\right)$$

$$= \frac{1}{3}\left(3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}-3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)\left(a+b\log\left(cx^n\right)\right)$$

$$= -bdn\sqrt{d+ex^2}-\frac{1}{9}bn\left(d+ex^2\right)^{3/2}+\frac{1}{3}\left(3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}-3d^{3/2}\,\mathrm{t}\right.$$

$$= -\frac{4}{3}bdn\sqrt{d+ex^2}-\frac{1}{9}bn\left(d+ex^2\right)^{3/2}+\frac{1}{2}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2+\frac{1}{3}\left(3\right.$$

$$= -\frac{4}{3}bdn\sqrt{d+ex^2}-\frac{1}{9}bn\left(d+ex^2\right)^{3/2}+bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}bd^{3/2}n$$

$$= -\frac{4}{3}bdn\sqrt{d+ex^2}-\frac{1}{9}bn\left(d+ex^2\right)^{3/2}+\frac{4}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}bd^{3/}$$

$$= -\frac{4}{3}bdn\sqrt{d+ex^2}-\frac{1}{9}bn\left(d+ex^2\right)^{3/2}+\frac{4}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}bd^{3/}$$

Mathematica [C] time = 0.84, size = 301, normalized size = 1.16

$$\frac{benx^2\sqrt{d+ex^2}\left(\frac{d\log(x)\left(\left(\frac{ex^2}{d}+1\right)^{3/2}-1\right)}{3ex^2}-\frac{1}{4}\,{}_3F_2\left(-\frac{1}{2},1,1;2,2;-\frac{ex^2}{d}\right)\right)}{\sqrt{\frac{ex^2}{d}+1}}+\frac{bdn\sqrt{d+ex^2}\left(-\,{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{d}{ex^2}\right)+\right.}{\sqrt{\frac{d}{ex^2}+1}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (b*e*n*x^2*Sqrt[d + e*x^2]*(-1/4*HypergeometricPFQ[{-1/2, 1, 1}, {2, 2}, -(
(e*x^2)/d)] + (d*(-1 + (1 + (e*x^2)/d)^(3/2))*Log[x])/(3*e*x^2)))/Sqrt[1 +
(e*x^2)/d] + (b*d*n*Sqrt[d + e*x^2]*(-HypergeometricPFQ[{-1/2, -1/2, -1/2},
 {1/2, 1/2}, -(d/(e*x^2))] + Sqrt[1 + d/(e*x^2)]*Log[x] - (Sqrt[d]*ArcSinh[
Sqrt[d]/(Sqrt[e]*x)]*Log[x])/(Sqrt[e]*x)))/Sqrt[1 + d/(e*x^2)] + (Sqrt[d +
e*x^2]*(4*d + e*x^2)*(a - b*n*Log[x] + b*Log[c*x^n]))/3 + d^(3/2)*Log[x]*(a
 - b*n*Log[x] + b*Log[c*x^n]) - d^(3/2)*(a - b*n*Log[x] + b*Log[c*x^n])*Log
[d + Sqrt[d]*Sqrt[d + e*x^2]]
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(bex^2+bd\right)\sqrt{ex^2+d}\,\log\left(cx^n\right)+\left(aex^2+ad\right)\sqrt{ex^2+d}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
[Out] integral(((b*e*x^2 + b*d)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^2 + a*d)*sqrt
(e*x^2 + d))/x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="giac")
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x, x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int\frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\ln\left(cx^n\right)+a\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x,x)
[Out] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}\left(3\,d^{\frac{3}{2}}\,\text{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)-\left(ex^2+d\right)^{\frac{3}{2}}-3\,\sqrt{ex^2+d}\,d\right)a+b\int\frac{\left(ex^2\log(c)+d\log(c)+\left(ex^2+d\right)\log\left(x^n\right)\right)\sqrt{ex}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
[Out] -1/3*(3*d^(3/2)*arcsinh(d/(sqrt(d*e)*abs(x))) - (e*x^2 + d)^(3/2) - 3*sqrt(
e*x^2 + d)*d)*a + b*integrate((e*x^2*log(c) + d*log(c) + (e*x^2 + d)*log(x^
n))*sqrt(e*x^2 + d)/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\left(ex^2+d\right)^{3/2}\,\left(a+b\,\ln\left(cx^n\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x,x)
[Out] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a+b\log\left(cx^n\right)\right)\left(d+ex^2\right)^{\frac{3}{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Integral((a + b*log(c*x**n))*(d + e*x**2)**(3/2)/x, x)
```

3.267 $\int \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=295

$$-\frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{2x^2}+\frac{3}{2}e\sqrt{d+ex^2}\,(a+b\log(cx^n))-\frac{3}{2}\sqrt{d}\,e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))-\frac{3}{4}$$

```
[Out] -1/2*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^2+3/4*b*e*n*arctanh((e*x^2+d)^(1/2)/
d^(1/2))*d^(1/2)+3/4*b*e*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))^2*d^(1/2)-3/2*e
*arctanh((e*x^2+d)^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*d^(1/2)-3/2*b*e*n*arctanh
((e*x^2+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(1/2)-(e*x^2+d)^(1/2)))*d^(1/2)-3
/4*b*e*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(e*x^2+d)^(1/2)))*d^(1/2)-b*e*n*(e*
x^2+d)^(1/2)-1/4*b*d*n*(e*x^2+d)^(1/2)/x^2+3/2*e*(a+b*ln(c*x^n))*(e*x^2+d)^
(1/2)
```

Rubi [A] time = 0.44, antiderivative size = 295, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {266, 47, 50, 63, 208, 2350, 12, 14, 5984, 5918, 2402, 2315}

$$-\frac{3}{4}b\sqrt{d}\,en\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)-\frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{2x^2}+\frac{3}{2}e\sqrt{d+ex^2}\,(a+b\log(cx^n))-\frac{3}{2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*e*n*Sqrt[d + e*x^2]) - (b*d*n*Sqrt[d + e*x^2])/(4*x^2) + (3*b*Sqrt[d]*e
*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/4 + (3*b*Sqrt[d]*e*n*ArcTanh[Sqrt[d +
e*x^2]/Sqrt[d]]^2)/4 + (3*e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/2 - ((d + e
*x^2)^(3/2)*(a + b*Log[c*x^n]))/(2*x^2) - (3*Sqrt[d]*e*ArcTanh[Sqrt[d + e*x
^2]/Sqrt[d]]*(a + b*Log[c*x^n]))/2 - (3*b*Sqrt[d]*e*n*ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/2 - (3*b*Sqrt[d]*
e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
```

```
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx = \frac{3}{2}e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{3}{2}\sqrt{d}\,e\,\text{ta}$$

$$=\frac{3}{2}e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{3}{2}\sqrt{d}\,e\,\text{ta}$$

$$=\frac{3}{2}e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{3}{2}\sqrt{d}\,e\,\text{ta}$$

$$=\frac{3}{2}e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{3}{2}\sqrt{d}\,e\,\text{ta}$$

$$=\frac{3}{2}e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{3}{2}\sqrt{d}\,e\,\text{ta}$$

$$=-ben\sqrt{d+ex^2}-\frac{bdn\sqrt{d+ex^2}}{4x^2}+\frac{3}{2}e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{(d+e}{}$$

$$=-ben\sqrt{d+ex^2}-\frac{bdn\sqrt{d+ex^2}}{4x^2}+\frac{3}{4}b\sqrt{d}\,en\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2+\frac{3}{2}e\sqrt{d}$$

$$=-ben\sqrt{d+ex^2}-\frac{bdn\sqrt{d+ex^2}}{4x^2}+\frac{3}{4}b\sqrt{d}\,en\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{3}{4}b\sqrt{d}$$

$$=-ben\sqrt{d+ex^2}-\frac{bdn\sqrt{d+ex^2}}{4x^2}+\frac{3}{4}b\sqrt{d}\,en\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{3}{4}b\sqrt{d}$$

$$=-ben\sqrt{d+ex^2}-\frac{bdn\sqrt{d+ex^2}}{4x^2}+\frac{3}{4}b\sqrt{d}\,en\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{3}{4}b\sqrt{d}$$

Mathematica [C] time = 0.96, size = 349, normalized size = 1.18

$$\frac{ben\sqrt{d+ex^2}\left(-{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{d}{ex^2}\right)+\log(x)\sqrt{\frac{d}{ex^2}+1}-\frac{\sqrt{d}\log(x)\sinh^{-1}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)}{\sqrt{e}x}\right)}{\sqrt{\frac{d}{ex^2}+1}}-\frac{b\sqrt{d}\,n\sqrt{d+ex^2}\left(2\sqrt{d}\ {}_3\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] (b*e*n*Sqrt[d + e*x^2]*(-HypergeometricPFQ[{-1/2, -1/2, -1/2}, {1/2, 1/2},
-(d/(e*x^2))] + Sqrt[1 + d/(e*x^2)]*Log[x] - (Sqrt[d]*ArcSinh[Sqrt[d]/(Sqrt
```

```
[e]*x)]*Log[x])/(Sqrt[e]*x)))/Sqrt[1 + d/(e*x^2)] - (b*Sqrt[d]*n*Sqrt[d + e
*x^2]*(2*Sqrt[d]*HypergeometricPFQ[{1/2, 1/2, 1/2}, {3/2, 3/2}, -(d/(e*x^2)
)] + (Sqrt[d]*Sqrt[1 + d/(e*x^2)] + Sqrt[e]*x*ArcSinh[Sqrt[d]/(Sqrt[e]*x)])
*(1 + 2*Log[x])))/(4*Sqrt[1 + d/(e*x^2)]*x^2) - ((d - 2*e*x^2)*Sqrt[d + e*x
^2]*(a - b*n*Log[x] + b*Log[c*x^n]))/(2*x^2) + (3*Sqrt[d]*e*Log[x]*(a - b*n
*Log[x] + b*Log[c*x^n]))/2 - (3*Sqrt[d]*e*(a - b*n*Log[x] + b*Log[c*x^n])*L
og[d + Sqrt[d]*Sqrt[d + e*x^2]])/2
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(bex^2+bd\right)\sqrt{ex^2+d}\,\log\left(cx^n\right)+\left(aex^2+ad\right)\sqrt{ex^2+d}}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x^2 + b*d)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^2 + a*d)*sqrt
(e*x^2 + d))/x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^3, x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int\frac{\left(e\,x^2+d\right)^{\frac{3}{2}}\left(b\ln\left(c\,x^n\right)+a\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^3,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\left(3\sqrt{d}\,e\,\text{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)-3\sqrt{ex^2+d}\,e-\frac{\left(ex^2+d\right)^{\frac{3}{2}}e}{d}+\frac{\left(ex^2+d\right)^{\frac{5}{2}}}{dx^2}\right)a+b\int\frac{\left(ex^2\log(c)+d\log(c)+\left(ex^2+d\right.\right.}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*(3*sqrt(d)*e*arcsinh(d/(sqrt(d*e)*abs(x))) - 3*sqrt(e*x^2 + d)*e - (e*
x^2 + d)^(3/2)*e/d + (e*x^2 + d)^(5/2)/(d*x^2))*a + b*integrate((e*x^2*log(
c) + d*log(c) + (e*x^2 + d)*log(x^n))*sqrt(e*x^2 + d)/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\left(e\,x^2+d\right)^{3/2}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^3,x)
```

```
[Out] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b\log\left(cx^{n}\right)\right)\left(d + ex^{2}\right)^{\frac{3}{2}}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))*(d + e*x**2)**(3/2)/x**3, x)
```

3.268 $\int x^2 \left(d+ex^2\right)^{3/2} \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=464

$$-\frac{d^{5/2}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{16e^{3/2}\sqrt{\frac{ex^2}{d}+1}}+\frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e}+\frac{1}{6}x^3\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)$$

```
[Out] 1/6*x^3*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))-11/192*b*d^2*n*x*(e*x^2+d)^(1/2)/e-
23/288*b*d*n*x^3*(e*x^2+d)^(1/2)-1/36*b*e*n*x^5*(e*x^2+d)^(1/2)+1/16*d^2*x*
(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/e+1/8*d*x^3*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)
-1/192*b*d^(5/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*(e*x^2+d)^(1/2)/e^(3/2)/(1+e*
x^2/d)^(1/2)-1/32*b*d^(5/2)*n*arcsinh(x*e^(1/2)/d^(1/2))^2*(e*x^2+d)^(1/2)/
e^(3/2)/(1+e*x^2/d)^(1/2)+1/16*b*d^(5/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*ln(1-
(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*(e*x^2+d)^(1/2)/e^(3/2)/(1+e*x^2/d
)^(1/2)-1/16*d^(5/2)*arcsinh(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*(e*x^2+d)^(
1/2)/e^(3/2)/(1+e*x^2/d)^(1/2)+1/32*b*d^(5/2)*n*polylog(2,(x*e^(1/2)/d^(1/2
)+(1+e*x^2/d)^(1/2))^2)*(e*x^2+d)^(1/2)/e^(3/2)/(1+e*x^2/d)^(1/2)
```

Rubi [A] time = 0.59, antiderivative size = 464, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {2341, 279, 321, 215, 2350, 12, 14, 195, 5659, 3716, 2190, 2279, 2391}

$$\frac{bd^{5/2}n\sqrt{d+ex^2}\,\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{32e^{3/2}\sqrt{\frac{ex^2}{d}+1}}-\frac{d^{5/2}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{16e^{3/2}\sqrt{\frac{ex^2}{d}+1}}+\frac{d^2x\sqrt{d+ex^2}\left(a+b\log\right.}{16e}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-11*b*d^2*n*x*Sqrt[d + e*x^2])/(192*e) - (23*b*d*n*x^3*Sqrt[d + e*x^2])/28
8 - (b*e*n*x^5*Sqrt[d + e*x^2])/36 - (b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]])/(192*e^(3/2)*Sqrt[1 + (e*x^2)/d]) - (b*d^(5/2)*n*Sqrt[
d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(32*e^(3/2)*Sqrt[1 + (e*x^2)/d])
 + (b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(16*e^(3/2)*Sqrt[1 + (e*x^2)/d]) + (d^2*x*Sq
rt[d + e*x^2]*(a + b*Log[c*x^n]))/(16*e) + (d*x^3*Sqrt[d + e*x^2]*(a + b*Lo
g[c*x^n]))/8 + (x^3*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/6 - (d^(5/2)*Sqrt
[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(16*e^(3/2)*Sq
rt[1 + (e*x^2)/d]) + (b*d^(5/2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]])])/(32*e^(3/2)*Sqrt[1 + (e*x^2)/d])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 279

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + n*p + 1)), x] + Dist[(a*n*p)/(m + n*p +
1), Int[(c*x)^m*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c, m}, x] && IG
tQ[n, 0] && GtQ[p, 0] && NeQ[m + n*p + 1, 0] && IntBinomialQ[a, b, c, n, m,
 p, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int x^2 \left(d+ex^2\right)^{3/2} \left(a+b\log\left(cx^n\right)\right) dx = \frac{\left(d\sqrt{d+ex^2}\right)\int x^2\left(1+\frac{ex^2}{d}\right)^{3/2}\left(a+b\log\left(cx^n\right)\right) dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$= \frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e} + \frac{1}{8}dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) + \frac{1}{6}$$

$$= \frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e} + \frac{1}{8}dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) + \frac{1}{6}$$

$$= \frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e} + \frac{1}{8}dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) + \frac{1}{6}$$

$$= \frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e} + \frac{1}{8}dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) + \frac{1}{6}$$

$$= -\frac{bd^2nx\sqrt{d+ex^2}}{32e} - \frac{7}{96}bdnx^3\sqrt{d+ex^2} - \frac{1}{36}benx^5\sqrt{d+ex^2} + \frac{d^2x\sqrt{d}}{}$$

$$= -\frac{13bd^2nx\sqrt{d+ex^2}}{192e} - \frac{23}{288}bdnx^3\sqrt{d+ex^2} - \frac{1}{36}benx^5\sqrt{d+ex^2} - \frac{bd^5}{}$$

$$= -\frac{11bd^2nx\sqrt{d+ex^2}}{192e} - \frac{23}{288}bdnx^3\sqrt{d+ex^2} - \frac{1}{36}benx^5\sqrt{d+ex^2} + \frac{bd^5}{}$$

$$= -\frac{11bd^2nx\sqrt{d+ex^2}}{192e} - \frac{23}{288}bdnx^3\sqrt{d+ex^2} - \frac{1}{36}benx^5\sqrt{d+ex^2} - \frac{bd^5}{}$$

$$= -\frac{11bd^2nx\sqrt{d+ex^2}}{192e} - \frac{23}{288}bdnx^3\sqrt{d+ex^2} - \frac{1}{36}benx^5\sqrt{d+ex^2} - \frac{bd^5}{}$$

Mathematica [C] time = 1.19, size = 331, normalized size = 0.71

$$\frac{-144be^{5/2}nx^5\sqrt{d+ex^2}\,{}_3F_2\left(-\frac{1}{2},\frac{5}{2},\frac{5}{2};\frac{7}{2},\frac{7}{2};-\frac{ex^2}{d}\right) - 400bde^{3/2}nx^3\sqrt{d+ex^2}\,{}_3F_2\left(-\frac{1}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};-\frac{ex^2}{d}\right) - 75\left(\sqrt{\frac{ex^2}{d}}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-400*b*d*e^(3/2)*n*x^3*Sqrt[d + e*x^2]*HypergeometricPFQ[{-1/2, 3/2, 3/2},
 {5/2, 5/2}, -((e*x^2)/d)] - 144*b*e^(5/2)*n*x^5*Sqrt[d + e*x^2]*Hypergeome
tricPFQ[{-1/2, 5/2, 5/2}, {7/2, 7/2}, -((e*x^2)/d)] - 75*(3*b*d^(5/2)*n*Sqr
t[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[x] + Sqrt[1 + (e*x^2)/d]*(-(a
*Sqrt[e]*x*Sqrt[d + e*x^2]*(3*d^2 + 14*d*e*x^2 + 8*e^2*x^4)) + 3*d^3*(a - b
*n*Log[x])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]] - b*Log[c*x^n]*(Sqrt[e]*x*Sqr
t[d + e*x^2]*(3*d^2 + 14*d*e*x^2 + 8*e^2*x^4) - 3*d^3*Log[e*x + Sqrt[e]*Sqr
t[d + e*x^2]]))))/(3600*e^(3/2)*Sqrt[1 + (e*x^2)/d])
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(bex^4 + bdx^2\right)\sqrt{ex^2 + d}\,\log\left(cx^n\right) + \left(aex^4 + adx^2\right)\sqrt{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral((b*e*x^4 + b*d*x^2)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^4 + a*d*x^
2)*sqrt(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(ex^2 + d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right) + a\right)x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)*x^2, x)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

$$\int \left(e\,x^2 + d\right)^{\frac{3}{2}} \left(b\ln\left(c\,x^n\right) + a\right) x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

```
[Out] int(x^2*(e*x^2+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{48}\left(\frac{8\left(ex^2 + d\right)^{\frac{5}{2}}x}{e} - \frac{2\left(ex^2 + d\right)^{\frac{3}{2}}dx}{e} - \frac{3\sqrt{ex^2 + d}\,d^2x}{e} - \frac{3\,d^3\,\text{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{e^{\frac{3}{2}}}\right)a + b\int \left(ex^4\log(c) + dx^2\log(c) + \left(ex\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] 1/48*(8*(e*x^2 + d)^(5/2)*x/e - 2*(e*x^2 + d)^(3/2)*d*x/e - 3*sqrt(e*x^2 +
d)*d^2*x/e - 3*d^3*arcsinh(e*x/sqrt(d*e))/e^(3/2))*a + b*integrate((e*x^4*l
og(c) + d*x^2*log(c) + (e*x^4 + d*x^2)*log(x^n))*sqrt(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\left(e\,x^2 + d\right)^{3/2}\,\left(a + b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d + e*x^2)^(3/2)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^2*(d + e*x^2)^(3/2)*(a + b*log(c*x^n)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^2 \left(a + b\log\left(cx^n\right)\right)\left(d + ex^2\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))*(d + e*x**2)**(3/2), x)
```

3.269 $\int \left(d+ex^2\right)^{3/2} \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=378

$$\frac{3d^{5/2}\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{8\sqrt{e}\sqrt{d+ex^2}}+\frac{3}{8}dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}x\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)-$$

```
[Out] -1/16*b*n*x*(e*x^2+d)^(3/2)+1/4*x*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))-9/32*b*d^
2*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/e^(1/2)-9/32*b*d*n*x*(e*x^2+d)^(1/2)
+3/8*d*x*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)+3/16*b*d^(5/2)*n*arcsinh(x*e^(1/2)
/d^(1/2))^2*(1+e*x^2/d)^(1/2)/e^(1/2)/(e*x^2+d)^(1/2)-3/8*b*d^(5/2)*n*arcsi
nh(x*e^(1/2)/d^(1/2))*ln(1-(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*(1+e*x^
2/d)^(1/2)/e^(1/2)/(e*x^2+d)^(1/2)+3/8*d^(5/2)*arcsinh(x*e^(1/2)/d^(1/2))*(
a+b*ln(c*x^n))*(1+e*x^2/d)^(1/2)/e^(1/2)/(e*x^2+d)^(1/2)-3/16*b*d^(5/2)*n*p
olylog(2,(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*(1+e*x^2/d)^(1/2)/e^(1/2)
/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.27, antiderivative size = 378, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {2321, 195, 217, 206, 2327, 2325, 5659, 3716, 2190, 2279, 2391}

$$-\frac{3bd^{5/2}n\sqrt{\frac{ex^2}{d}+1}\,\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{16\sqrt{e}\sqrt{d+ex^2}}+\frac{3d^{5/2}\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{8\sqrt{e}\sqrt{d+ex^2}}+\frac{3}{8}dx\sqrt{d+ex^2}\left(a+\right.$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-9*b*d*n*x*Sqrt[d + e*x^2])/32 - (b*n*x*(d + e*x^2)^(3/2))/16 + (3*b*d^(5/
2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(16*Sqrt[e]*Sqrt[d
 + e*x^2]) - (9*b*d^2*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(32*Sqrt[e])
- (3*b*d^(5/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E
^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(8*Sqrt[e]*Sqrt[d + e*x^2]) + (3*d*x*Sq
rt[d + e*x^2]*(a + b*Log[c*x^n]))/8 + (x*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n
]))/4 + (3*d^(5/2)*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*
Log[c*x^n]))/(8*Sqrt[e]*Sqrt[d + e*x^2]) - (3*b*d^(5/2)*n*Sqrt[1 + (e*x^2)/
d]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(16*Sqrt[e]*Sqrt[d + e*x
^2])
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2321

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Sy
mbol] :> Simp[(x*(d + e*x^2)^q*(a + b*Log[c*x^n]))/(2*q + 1), x] + (-Dist[(
b*n)/(2*q + 1), Int[(d + e*x^2)^q, x], x] + Dist[(2*d*q)/(2*q + 1), Int[(d
+ e*x^2)^(q - 1)*(a + b*Log[c*x^n]), x], x]) /; FreeQ[{a, b, c, d, e, n}, x
] && GtQ[q, 0]
```

Rule 2325

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[e, 2], x]
 - Dist[(b*n)/Rt[e, 2], Int[ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]/x, x], x] /; Free
Q[{a, b, c, d, e, n}, x] && GtQ[d, 0] && PosQ[e]
```

Rule 2327

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Dist[Sqrt[1 + (e*x^2)/d]/Sqrt[d + e*x^2], Int[(a + b*Log[c*x^n])/Sqr
t[1 + (e*x^2)/d], x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&  !GtQ[d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int \left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)dx = \frac{1}{4}x\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}(3d)\int\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)dx$$

$$= -\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3}{8}dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}x\left(d+ex^2\right)^{3/2}(a$$

$$= -\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3}{8}dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)$$

$$= -\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3}{8}dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)$$

$$= -\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}-\frac{9bd^2n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{32\sqrt{e}}+\frac{3}{8}dx$$

$$= -\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3bd^{5/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{16\sqrt{e}\sqrt{d+ex^2}}$$

$$= -\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3bd^{5/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{16\sqrt{e}\sqrt{d+ex^2}}$$

$$= -\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3bd^{5/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{16\sqrt{e}\sqrt{d+ex^2}}$$

$$= -\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3bd^{5/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{16\sqrt{e}\sqrt{d+ex^2}}$$

Mathematica [C] time = 1.03, size = 314, normalized size = 0.83

$$9\left(-4bd\sqrt{e}nx\sqrt{d+ex^2}\,{}_3F_2\left(\frac{1}{2},\frac{1}{2},\frac{1}{2};\frac{3}{2},\frac{3}{2};-\frac{ex^2}{d}\right)+\sqrt{\frac{ex^2}{d}+1}\left(3d^2\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)(a-bn\log(x))+\sqrt{e}x\sqrt{\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-8*b*e^(3/2)*n*x^3*Sqrt[d + e*x^2]*HypergeometricPFQ[{-1/2, 3/2, 3/2}, {5/
2, 5/2}, -((e*x^2)/d)] + 9*(-4*b*d*Sqrt[e]*n*x*Sqrt[d + e*x^2]*Hypergeometr
icPFQ[{1/2, 1/2, 1/2}, {3/2, 3/2}, -((e*x^2)/d)] + b*d^(3/2)*n*Sqrt[d + e*x
^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(-2 + 3*Log[x]) + Sqrt[1 + (e*x^2)/d]*(Sqr
t[e]*x*Sqrt[d + e*x^2]*(5*a*d - 2*b*d*n + 2*a*e*x^2) + 3*d^2*(a - b*n*Log[x
])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]] + b*Log[c*x^n]*(Sqrt[e]*x*Sqrt[d + e*
x^2]*(5*d + 2*e*x^2) + 3*d^2*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]]))))/(72*Sqr
t[e]*Sqrt[1 + (e*x^2)/d])
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(bex^2+bd\right)\sqrt{ex^2+d}\,\log\left(cx^n\right)+\left(aex^2+ad\right)\sqrt{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral((b*e*x^2 + b*d)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^2 + a*d)*sqrt(
e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(ex^2 + d\right)^{\frac{3}{2}} \left(b \log\left(cx^n\right) + a\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \left(e\,x^2 + d\right)^{\frac{3}{2}} \left(b \ln\left(c\,x^n\right) + a\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

```
[Out] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{8}\left(2\left(ex^2 + d\right)^{\frac{3}{2}} x + 3\sqrt{ex^2 + d}\,dx + \frac{3\,d^2 \operatorname{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{e}}\right)a + b\int \left(ex^2 \log(c) + d\log(c) + \left(ex^2 + d\right)\log\left(x^n\right)\right)\sqrt{ex^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] 1/8*(2*(e*x^2 + d)^(3/2)*x + 3*sqrt(e*x^2 + d)*d*x + 3*d^2*arcsinh(e*x/sqrt
(d*e))/sqrt(e))*a + b*integrate((e*x^2*log(c) + d*log(c) + (e*x^2 + d)*log(
x^n))*sqrt(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(e\,x^2+d\right)}^{3/2}\,\left(a+b\,\ln\left(c\,x^n\right)\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^2)^(3/2)*(a + b*log(c*x^n)),x)
```

```
[Out] int((d + e*x^2)^(3/2)*(a + b*log(c*x^n)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a + b \log\left(cx^n\right)\right) \left(d + ex^2\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Integral((a + b*log(c*x**n))*(d + e*x**2)**(3/2), x)
```

3.270 $\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log(cx^n)\right)}{x^2}\,dx$

Optimal. Leaf size=400

$$-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)+\frac{3\sqrt{d}\sqrt{e}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2\sqrt{\frac{ex^2}{d}+1}}$$

```
[Out] -(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x-b*d*n*(e*x^2+d)^(1/2)/x-1/4*b*e*n*x*(e*x
^2+d)^(1/2)+3/2*e*x*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)+3/4*b*n*arcsinh(x*e^(1/
2)/d^(1/2))*d^(1/2)*e^(1/2)*(e*x^2+d)^(1/2)/(1+e*x^2/d)^(1/2)+3/4*b*n*arcsi
nh(x*e^(1/2)/d^(1/2))^2*d^(1/2)*e^(1/2)*(e*x^2+d)^(1/2)/(1+e*x^2/d)^(1/2)-3
/2*b*n*arcsinh(x*e^(1/2)/d^(1/2))*ln(1-(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2)
)^2)*d^(1/2)*e^(1/2)*(e*x^2+d)^(1/2)/(1+e*x^2/d)^(1/2)+3/2*arcsinh(x*e^(1/2
)/d^(1/2))*(a+b*ln(c*x^n))*d^(1/2)*e^(1/2)*(e*x^2+d)^(1/2)/(1+e*x^2/d)^(1/2
)-3/4*b*n*polylog(2,(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*d^(1/2)*e^(1/2
)*(e*x^2+d)^(1/2)/(1+e*x^2/d)^(1/2)
```

Rubi [A] time = 0.48, antiderivative size = 400, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {2341, 277, 195, 215, 2350, 12, 14, 5659, 3716, 2190, 2279, 2391}

$$-\frac{3b\sqrt{d}\sqrt{e}n\sqrt{d+ex^2}\,\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4\sqrt{\frac{ex^2}{d}+1}}-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)+$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d*n*Sqrt[d + e*x^2])/x) - (b*e*n*x*Sqrt[d + e*x^2])/4 + (3*b*Sqrt[d]*S
qrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(4*Sqrt[1 + (e*x^2)/
d]) + (3*b*Sqrt[d]*Sqrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2
)/(4*Sqrt[1 + (e*x^2)/d]) - (3*b*Sqrt[d]*Sqrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[
(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[1
 + (e*x^2)/d]) + (3*e*x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/2 - ((d + e*x^2
)^(3/2)*(a + b*Log[c*x^n]))/x + (3*Sqrt[d]*Sqrt[e]*Sqrt[d + e*x^2]*ArcSinh[
(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*Sqrt[1 + (e*x^2)/d]) - (3*b*Sqr
t[d]*Sqrt[e]*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]
)])/(4*Sqrt[1 + (e*x^2)/d])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
```

```
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
```

```
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx = \frac{\left(d\sqrt{d+ex^2}\right)\int \frac{\left(1+\frac{ex^2}{d}\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$= \frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{3\sqrt{d}\sqrt{e}\sqrt{}}{}$$

$$= \frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{3\sqrt{d}\sqrt{e}\sqrt{}}{}$$

$$= \frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{3\sqrt{d}\sqrt{e}\sqrt{}}{}$$

$$= \frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{3\sqrt{d}\sqrt{e}\sqrt{}}{}$$

$$= -\frac{bdn\sqrt{d+ex^2}}{x} - \frac{1}{4}benx\sqrt{d+ex^2} + \frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) - \frac{(d+}{}$$

$$= -\frac{bdn\sqrt{d+ex^2}}{x} - \frac{1}{4}benx\sqrt{d+ex^2} + \frac{3b\sqrt{d}\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{1+\frac{ex^2}{d}}} + $$

$$= -\frac{bdn\sqrt{d+ex^2}}{x} - \frac{1}{4}benx\sqrt{d+ex^2} + \frac{3b\sqrt{d}\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{1+\frac{ex^2}{d}}} + $$

$$= -\frac{bdn\sqrt{d+ex^2}}{x} - \frac{1}{4}benx\sqrt{d+ex^2} + \frac{3b\sqrt{d}\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{1+\frac{ex^2}{d}}} + $$

$$= -\frac{bdn\sqrt{d+ex^2}}{x} - \frac{1}{4}benx\sqrt{d+ex^2} + \frac{3b\sqrt{d}\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{1+\frac{ex^2}{d}}} + $$

Mathematica [C] time = 1.15, size = 329, normalized size = 0.82

$$-\frac{b\sqrt{d}\,n\sqrt{d+ex^2}\left(\sqrt{d}\;{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{ex^2}{d}\right)+\log(x)\left(\sqrt{d}\sqrt{\frac{ex^2}{d}+1}-\sqrt{e}\,x\sinh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\right)\right)}{x\sqrt{\frac{ex^2}{d}+1}}+\frac{b\sqrt{e}\,n\sqrt{d+
$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*Sqrt[d]*n*Sqrt[d + e*x^2]*(Sqrt[d]*HypergeometricPFQ[{-1/2, -1/2, -1/2
}, {1/2, 1/2}, -((e*x^2)/d)] + (Sqrt[d]*Sqrt[1 + (e*x^2)/d] - Sqrt[e]*x*Arc
Sinh[(Sqrt[e]*x)/Sqrt[d]])*Log[x]))/(x*Sqrt[1 + (e*x^2)/d])) + (b*Sqrt[e]*n
*Sqrt[d + e*x^2]*(-2*Sqrt[e]*x*HypergeometricPFQ[{1/2, 1/2, 1/2}, {3/2, 3/2
}, -((e*x^2)/d)] + (Sqrt[e]*x*Sqrt[1 + (e*x^2)/d] + Sqrt[d]*ArcSinh[(Sqrt[e
]*x)/Sqrt[d]])*(-1 + 2*Log[x])))/(4*Sqrt[1 + (e*x^2)/d]) - ((2*d - e*x^2)*S
qrt[d + e*x^2]*(a - b*n*Log[x] + b*Log[c*x^n]))/(2*x) + (3*d*Sqrt[e]*(a - b
*n*Log[x] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/2
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(bex^2+bd\right)\sqrt{ex^2+d}\,\log\left(cx^n\right)+\left(aex^2+ad\right)\sqrt{ex^2+d}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x^2 + b*d)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^2 + a*d)*sqrt
(e*x^2 + d))/x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^2, x)
```

maple [F] time = 0.35, size = 0, normalized size = 0.00

$$\int\frac{\left(e\,x^2+d\right)^{\frac{3}{2}}\left(b\ln\left(c\,x^n\right)+a\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^2,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\left(3\sqrt{ex^2+d}\,ex+3\,d\sqrt{e}\,\text{arsinh}\left(\frac{ex}{\sqrt{de}}\right)-\frac{2\left(ex^2+d\right)^{\frac{3}{2}}}{x}\right)a+b\int\frac{\left(ex^2\log(c)+d\log(c)+\left(ex^2+d\right)\log\left(x^n\right)\right)\sqrt{e
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] 1/2*(3*sqrt(e*x^2 + d)*e*x + 3*d*sqrt(e)*arcsinh(e*x/sqrt(d*e)) - 2*(e*x^2
+ d)^(3/2)/x)*a + b*integrate((e*x^2*log(c) + d*log(c) + (e*x^2 + d)*log(x^
n))*sqrt(e*x^2 + d)/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(e\,x^2+d\right)^{3/2}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^2,x)
```

```
[Out] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \log\left(cx^{n}\right)\right)\left(d + ex^{2}\right)^{\frac{3}{2}}}{x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))*(d + e*x**2)**(3/2)/x**2, x)
```

3.271 $\int \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=400

$$\frac{e^{3/2}\sqrt{d+ex^2}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}}-\frac{e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{be^{3/2}}{}$$

```
[Out] -1/9*b*n*(e*x^2+d)^(3/2)/x^3-1/3*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^3-4/3*b*
e*n*(e*x^2+d)^(1/2)/x-e*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x+4/3*b*e^(3/2)*n*a
rcsinh(x*e^(1/2)/d^(1/2))*(e*x^2+d)^(1/2)/d^(1/2)/(1+e*x^2/d)^(1/2)+1/2*b*e
^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))^2*(e*x^2+d)^(1/2)/d^(1/2)/(1+e*x^2/d)^(
1/2)-b*e^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*ln(1-(x*e^(1/2)/d^(1/2)+(1+e*x^
2/d)^(1/2))^2)*(e*x^2+d)^(1/2)/d^(1/2)/(1+e*x^2/d)^(1/2)+e^(3/2)*arcsinh(x*
e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/d^(1/2)/(1+e*x^2/d)^(1/2)-
1/2*b*e^(3/2)*n*polylog(2,(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*(e*x^2+d
)^(1/2)/d^(1/2)/(1+e*x^2/d)^(1/2)
```

Rubi [A] time = 0.44, antiderivative size = 400, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {2341, 277, 215, 2350, 451, 5659, 3716, 2190, 2279, 2391}

$$-\frac{be^{3/2}n\sqrt{d+ex^2}\,\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2\sqrt{d}\sqrt{\frac{ex^2}{d}+1}}+\frac{e^{3/2}\sqrt{d+ex^2}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}}-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\right.}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] (-4*b*e*n*Sqrt[d + e*x^2])/(3*x) - (b*n*(d + e*x^2)^(3/2))/(9*x^3) + (4*b*e
^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(3*Sqrt[d]*Sqrt[1 +
(e*x^2)/d]) + (b*e^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/
(2*Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*e^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqr
t[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(Sqrt[d]*Sqrt
[1 + (e*x^2)/d]) - (e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x - ((d + e*x^2)^
(3/2)*(a + b*Log[c*x^n]))/(3*x^3) + (e^(3/2)*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[
e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*e^(3/
2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqr
t[d]*Sqrt[1 + (e*x^2)/d])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] && !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x^4}\,dx = \frac{\left(d\sqrt{d+ex^2}\right)\int \frac{\left(1+\frac{ex^2}{d}\right)^{3/2}\left(a+b\log(cx^n)\right)}{x^4}\,dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$= -\frac{e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3x^3} + \frac{e^{3/2}\sqrt{d}}{}$$

$$= -\frac{e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3x^3} + \frac{e^{3/2}\sqrt{d}}{}$$

$$= -\frac{bn\left(d+ex^2\right)^{3/2}}{9x^3} - \frac{e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\right.}{3x^3}$$

$$= -\frac{4ben\sqrt{d+ex^2}}{3x} - \frac{bn\left(d+ex^2\right)^{3/2}}{9x^3} + \frac{be^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} - \frac{e}{}$$

$$= -\frac{4ben\sqrt{d+ex^2}}{3x} - \frac{bn\left(d+ex^2\right)^{3/2}}{9x^3} + \frac{4be^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{b}{}$$

$$= -\frac{4ben\sqrt{d+ex^2}}{3x} - \frac{bn\left(d+ex^2\right)^{3/2}}{9x^3} + \frac{4be^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{b}{}$$

$$= -\frac{4ben\sqrt{d+ex^2}}{3x} - \frac{bn\left(d+ex^2\right)^{3/2}}{9x^3} + \frac{4be^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{b}{}$$

Mathematica [C] time = 0.78, size = 269, normalized size = 0.67

$$\frac{ben\sqrt{d+ex^2}\left(-{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{ex^2}{d}\right)-\log(x)\sqrt{\frac{ex^2}{d}+1}+\frac{\sqrt{e}x\log(x)\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}}\right)}{x\sqrt{\frac{ex^2}{d}+1}}+e^{3/2}\log\left(\sqrt{e}\sqrt{d+ex^2}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] (b*d*n*Sqrt[d + e*x^2]*(-Hypergeometric2F1[-3/2, -3/2, -1/2, -((e*x^2)/d)]
- 3*(1 + (e*x^2)/d)^(3/2)*Log[x]))/(9*x^3*Sqrt[1 + (e*x^2)/d]) + (b*e*n*Sqr
t[d + e*x^2]*(-HypergeometricPFQ[{-1/2, -1/2, -1/2}, {1/2, 1/2}, -((e*x^2)/
d)] - Sqrt[1 + (e*x^2)/d]*Log[x] + (Sqrt[e]*x*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*
Log[x])/Sqrt[d]))/(x*Sqrt[1 + (e*x^2)/d]) - (Sqrt[d + e*x^2]*(d + 4*e*x^2)*
(a - b*n*Log[x] + b*Log[c*x^n]))/(3*x^3) + e^(3/2)*(a - b*n*Log[x] + b*Log[
c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]]
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(bex^2+bd\right)\sqrt{ex^2+d}\,\log\left(cx^n\right)+\left(aex^2+ad\right)\sqrt{ex^2+d}}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x^2 + b*d)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^2 + a*d)*sqrt
(e*x^2 + d))/x^4, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^4, x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^2+d\right)^{\frac{3}{2}}\left(b\ln\left(c\,x^n\right)+a\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^4,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\left(\frac{3\sqrt{ex^2+d}\,e^2x}{d}+3\,e^{\frac{3}{2}}\operatorname{arsinh}\left(\frac{ex}{\sqrt{de}}\right)-\frac{2\left(ex^2+d\right)^{\frac{3}{2}}e}{dx}-\frac{\left(ex^2+d\right)^{\frac{5}{2}}}{dx^3}\right)a+b\int \frac{\left(ex^2\log(c)+d\log(c)+\left(ex^2+d\right)\mathrm{l}\right.}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] 1/3*(3*sqrt(e*x^2 + d)*e^2*x/d + 3*e^(3/2)*arcsinh(e*x/sqrt(d*e)) - 2*(e*x^
2 + d)^(3/2)*e/(d*x) - (e*x^2 + d)^(5/2)/(d*x^3))*a + b*integrate((e*x^2*lo
g(c) + d*log(c) + (e*x^2 + d)*log(x^n))*sqrt(e*x^2 + d)/x^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(e\,x^2+d\right)^{3/2}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^4,x)
```

```
[Out] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^{n}\right)\right)\left(d+ex^{2}\right)^{\frac{3}{2}}}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] Integral((a + b*log(c*x**n))*(d + e*x**2)**(3/2)/x**4, x)
```

3.272 $\int \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=138

$$-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5}+\frac{be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{5d}-\frac{be^2n\sqrt{d+ex^2}}{5dx}-\frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5}-\frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3}$$

```
[Out] -1/15*b*e*n*(e*x^2+d)^(3/2)/d/x^3-1/25*b*n*(e*x^2+d)^(5/2)/d/x^5+1/5*b*e^(5
/2)*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/d-1/5*(e*x^2+d)^(5/2)*(a+b*ln(c*x^
n))/d/x^5-1/5*b*e^2*n*(e*x^2+d)^(1/2)/d/x
```

Rubi [A] time = 0.12, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2335, 277, 217, 206}

$$-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5}-\frac{be^2n\sqrt{d+ex^2}}{5dx}+\frac{be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{5d}-\frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3}-\frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*e^2*n*Sqrt[d + e*x^2])/(5*d*x) - (b*e*n*(d + e*x^2)^(3/2))/(15*d*x^3) -
 (b*n*(d + e*x^2)^(5/2))/(25*d*x^5) + (b*e^(5/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt
[d + e*x^2]])/(5*d) - ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*d*x^5)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x^6}\,dx = -\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5} + \frac{(bn)\int \frac{\left(d+ex^2\right)^{5/2}}{x^6}dx}{5d}$$
$$= -\frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5} - \frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5} + \frac{(ben)\int \frac{\left(d+ex^2\right)^{3/2}}{x^4}dx}{5d}$$
$$= -\frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5} - \frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5} + \frac{(b$$
$$= -\frac{be^2n\sqrt{d+ex^2}}{5dx} - \frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5} - \frac{\left(d+ex^2\right)^{5/2}\left(a+\right.}{5dx^5}$$
$$= -\frac{be^2n\sqrt{d+ex^2}}{5dx} - \frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5} - \frac{\left(d+ex^2\right)^{5/2}\left(a+\right.}{5dx^5}$$
$$= -\frac{be^2n\sqrt{d+ex^2}}{5dx} - \frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5} + \frac{be^{5/2}n\tanh^{-1}\left(\right.}{5d}$$

Mathematica [A] time = 0.21, size = 114, normalized size = 0.83

$$-\frac{\sqrt{d+ex^2}\left(15a\left(d+ex^2\right)^2+bn\left(3d^2+11dex^2+23e^2x^4\right)\right)+15b\left(d+ex^2\right)^{5/2}\log\left(cx^n\right)-15be^{5/2}nx^5\log\left(\sqrt{e}\sqrt{\right.}\right.}{75dx^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -1/75*(Sqrt[d + e*x^2]*(15*a*(d + e*x^2)^2 + b*n*(3*d^2 + 11*d*e*x^2 + 23*e
^2*x^4)) + 15*b*(d + e*x^2)^(5/2)*Log[c*x^n] - 15*b*e^(5/2)*n*x^5*Log[e*x +
 Sqrt[e]*Sqrt[d + e*x^2]])/(d*x^5)
```

fricas [A] time = 0.48, size = 314, normalized size = 2.28

$$\left[\frac{15\,be^{\frac{5}{2}}nx^5\log\left(-2\,ex^2-2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)-2\left(\left(23\,be^2n+15\,ae^2\right)x^4+3\,bd^2n+15\,ad^2+(11\,bden+30\,ade\right.\right.}{150\,dx^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] [1/150*(15*b*e^(5/2)*n*x^5*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x - d)
- 2*((23*b*e^2*n + 15*a*e^2)*x^4 + 3*b*d^2*n + 15*a*d^2 + (11*b*d*e*n + 30*
a*d*e)*x^2 + 15*(b*e^2*x^4 + 2*b*d*e*x^2 + b*d^2)*log(c) + 15*(b*e^2*n*x^4
+ 2*b*d*e*n*x^2 + b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d*x^5), -1/75*(15*b*sq
rt(-e)*e^2*n*x^5*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + ((23*b*e^2*n + 15*a*e
^2)*x^4 + 3*b*d^2*n + 15*a*d^2 + (11*b*d*e*n + 30*a*d*e)*x^2 + 15*(b*e^2*x^
4 + 2*b*d*e*x^2 + b*d^2)*log(c) + 15*(b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n
)*log(x))*sqrt(e*x^2 + d))/(d*x^5)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^6, x)
```

maple [F] time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^{2}+d\right)^{\frac{3}{2}}\left(b\ln\left(c\,x^{n}\right)+a\right)}{x^{6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^6,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^6,x)
```

maxima [A] time = 0.64, size = 156, normalized size = 1.13

$$\frac{\left(\frac{10\left(ex^{2}+d\right)^{\frac{3}{2}}e^{3}x}{d^{2}}+\frac{15\sqrt{ex^{2}+d}\,e^{3}x}{d}+15\,e^{\frac{5}{2}}\,\mathrm{arsinh}\left(\frac{ex}{\sqrt{de}}\right)-\frac{8\left(ex^{2}+d\right)^{\frac{5}{2}}e^{2}}{d^{2}x}-\frac{2\left(ex^{2}+d\right)^{\frac{7}{2}}e}{d^{2}x^{3}}-\frac{3\left(ex^{2}+d\right)^{\frac{7}{2}}}{dx^{5}}\right)bn}{75\,d}-\frac{\left(ex^{2}+d\right)^{\frac{5}{2}}b\log\left(cx^{n}\right.}{5\,dx^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] 1/75*(10*(e*x^2 + d)^(3/2)*e^3*x/d^2 + 15*sqrt(e*x^2 + d)*e^3*x/d + 15*e^(5
/2)*arcsinh(e*x/sqrt(d*e)) - 8*(e*x^2 + d)^(5/2)*e^2/(d^2*x) - 2*(e*x^2 + d
)^(7/2)*e/(d^2*x^3) - 3*(e*x^2 + d)^(7/2)/(d*x^5))*b*n/d - 1/5*(e*x^2 + d)^
(5/2)*b*log(c*x^n)/(d*x^5) - 1/5*(e*x^2 + d)^(5/2)*a/(d*x^5)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(e\,x^{2}+d\right)^{3/2}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{x^{6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^6,x)
```

```
[Out] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^6, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^{n}\right)\right)\left(d+ex^{2}\right)^{\frac{3}{2}}}{x^{6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] Integral((a + b*log(c*x**n))*(d + e*x**2)**(3/2)/x**6, x)
```

3.273 $\int \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{x^8}\,dx$

Optimal. Leaf size=196

$$\frac{2e\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{35d^2x^5}-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7}-\frac{2be^{7/2}n\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{35d^2}+\frac{2be^3n\sqrt{d+ex^2}}{35d^2x}+\frac{2b}{}$$

```
[Out] 2/105*b*e^2*n*(e*x^2+d)^(3/2)/d^2/x^3+2/175*b*e*n*(e*x^2+d)^(5/2)/d^2/x^5-1
/49*b*n*(e*x^2+d)^(7/2)/d^2/x^7-2/35*b*e^(7/2)*n*arctanh(x*e^(1/2)/(e*x^2+d
)^(1/2))/d^2-1/7*(e*x^2+d)^(5/2)*(a+b*ln(c*x^n))/d/x^7+2/35*e*(e*x^2+d)^(5/
2)*(a+b*ln(c*x^n))/d^2/x^5+2/35*b*e^3*n*(e*x^2+d)^(1/2)/d^2/x
```

Rubi [A] time = 0.17, antiderivative size = 196, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {271, 264, 2350, 12, 451, 277, 217, 206}

$$\frac{2e\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{35d^2x^5}-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7}+\frac{2be^3n\sqrt{d+ex^2}}{35d^2x}+\frac{2be^2n\left(d+ex^2\right)^{3/2}}{105d^2x^3}-\frac{2be^{7/2}n\,\mathrm{t}}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] (2*b*e^3*n*Sqrt[d + e*x^2])/(35*d^2*x) + (2*b*e^2*n*(d + e*x^2)^(3/2))/(105
*d^2*x^3) + (2*b*e*n*(d + e*x^2)^(5/2))/(175*d^2*x^5) - (b*n*(d + e*x^2)^(7
/2))/(49*d^2*x^7) - (2*b*e^(7/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3
5*d^2) - ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(7*d*x^7) + (2*e*(d + e*x^2
)^(5/2)*(a + b*Log[c*x^n]))/(35*d^2*x^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x^8}\,dx = -\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7}+\frac{2e\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{35d^2x^5}-(bn)\int$$

$$= -\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7}+\frac{2e\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{35d^2x^5}-\frac{(bn)\int}{}$$

$$= -\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7}+\frac{2e\left(d+ex^2\right)^{5/2}\left(a+b\log\right.}{35d^2x^5}$$

$$= \frac{2ben\left(d+ex^2\right)^{5/2}}{175d^2x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7}+\frac{2e\left(d\right.}{}$$

$$= \frac{2be^2n\left(d+ex^2\right)^{3/2}}{105d^2x^3}+\frac{2ben\left(d+ex^2\right)^{5/2}}{175d^2x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}-\frac{\left(d+ex^2\right)^{5/2}\left(a+\right.}{7dx}$$

$$= \frac{2be^3n\sqrt{d+ex^2}}{35d^2x}+\frac{2be^2n\left(d+ex^2\right)^{3/2}}{105d^2x^3}+\frac{2ben\left(d+ex^2\right)^{5/2}}{175d^2x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}$$

$$= \frac{2be^3n\sqrt{d+ex^2}}{35d^2x}+\frac{2be^2n\left(d+ex^2\right)^{3/2}}{105d^2x^3}+\frac{2ben\left(d+ex^2\right)^{5/2}}{175d^2x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}$$

$$= \frac{2be^3n\sqrt{d+ex^2}}{35d^2x}+\frac{2be^2n\left(d+ex^2\right)^{3/2}}{105d^2x^3}+\frac{2ben\left(d+ex^2\right)^{5/2}}{175d^2x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}$$

Mathematica [A] time = 0.24, size = 145, normalized size = 0.74

$$-\frac{\sqrt{d+ex^2}\left(105a\left(5d-2ex^2\right)\left(d+ex^2\right)^2+bn\left(75d^3+183d^2ex^2+71de^2x^4-247e^3x^6\right)\right)+105b\left(5d-2ex^2\right)\left(d+e\right.}{3675d^2x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -1/3675*(Sqrt[d + e*x^2]*(105*a*(5*d - 2*e*x^2)*(d + e*x^2)^2 + b*n*(75*d^3
 + 183*d^2*e*x^2 + 71*d*e^2*x^4 - 247*e^3*x^6)) + 105*b*(5*d - 2*e*x^2)*(d
+ e*x^2)^(5/2)*Log[c*x^n] + 210*b*e^(7/2)*n*x^7*Log[e*x + Sqrt[e]*Sqrt[d +
e*x^2]])/(d^2*x^7)
```

fricas [A] time = 0.52, size = 423, normalized size = 2.16

$$\left[\frac{105\,be^{\frac{7}{2}}nx^7\log\left(-2\,ex^2+2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)+\left(\left(247\,be^3n+210\,ae^3\right)x^6-75\,bd^3n-\left(71\,bde^2n+105\,ade^2\right)x\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")
```

```
[Out] [1/3675*(105*b*e^(7/2)*n*x^7*log(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d
) + ((247*b*e^3*n + 210*a*e^3)*x^6 - 75*b*d^3*n - (71*b*d*e^2*n + 105*a*d*e
^2)*x^4 - 525*a*d^3 - 3*(61*b*d^2*e*n + 280*a*d^2*e)*x^2 + 105*(2*b*e^3*x^6
 - b*d*e^2*x^4 - 8*b*d^2*e*x^2 - 5*b*d^3)*log(c) + 105*(2*b*e^3*n*x^6 - b*d
*e^2*n*x^4 - 8*b*d^2*e*n*x^2 - 5*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/(d^2*x^7
), 1/3675*(210*b*sqrt(-e)*e^3*n*x^7*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + ((
247*b*e^3*n + 210*a*e^3)*x^6 - 75*b*d^3*n - (71*b*d*e^2*n + 105*a*d*e^2)*x^
4 - 525*a*d^3 - 3*(61*b*d^2*e*n + 280*a*d^2*e)*x^2 + 105*(2*b*e^3*x^6 - b*d
*e^2*x^4 - 8*b*d^2*e*x^2 - 5*b*d^3)*log(c) + 105*(2*b*e^3*n*x^6 - b*d*e^2*n
*x^4 - 8*b*d^2*e*n*x^2 - 5*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/(d^2*x^7)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^8,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^8, x)
```

maple [F] time = 0.46, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^2+d\right)^{\frac{3}{2}}\left(b\ln\left(c\,x^n\right)+a\right)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^8,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^8,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{35}\,a\left(\frac{2\left(ex^2+d\right)^{\frac{5}{2}}e}{d^2x^5}-\frac{5\left(ex^2+d\right)^{\frac{5}{2}}}{dx^7}\right)+b\int \frac{\left(ex^2\log(c)+d\log(c)+\left(ex^2+d\right)\log\left(x^n\right)\right)\sqrt{ex^2+d}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")
```

```
[Out] 1/35*a*(2*(e*x^2 + d)^(5/2)*e/(d^2*x^5) - 5*(e*x^2 + d)^(5/2)/(d*x^7)) + b*
integrate((e*x^2*log(c) + d*log(c) + (e*x^2 + d)*log(x^n))*sqrt(e*x^2 + d)/
x^8, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(e\,x^2+d\right)^{3/2}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^8,x)
```

```
[Out] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^8, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] Timed out
```

3.274 $\int \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{x^{10}}\,dx$

Optimal. Leaf size=256

$$-\frac{8e^2\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{315d^3x^5}+\frac{4e\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{63d^2x^7}-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{9dx^9}+\frac{8be^{9/2}n\,\mathrm{ta}}{3}$$

```
[Out] -8/945*b*e^3*n*(e*x^2+d)^(3/2)/d^3/x^3-8/1575*b*e^2*n*(e*x^2+d)^(5/2)/d^3/x
^5-1/81*b*n*(e*x^2+d)^(7/2)/d^2/x^9+50/3969*b*e*n*(e*x^2+d)^(7/2)/d^3/x^7+8
/315*b*e^(9/2)*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/d^3-1/9*(e*x^2+d)^(5/2)
*(a+b*ln(c*x^n))/d/x^9+4/63*e*(e*x^2+d)^(5/2)*(a+b*ln(c*x^n))/d^2/x^7-8/315
*e^2*(e*x^2+d)^(5/2)*(a+b*ln(c*x^n))/d^3/x^5-8/315*b*e^4*n*(e*x^2+d)^(1/2)/
d^3/x
```

Rubi [A] time = 0.22, antiderivative size = 256, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {271, 264, 2350, 12, 1265, 451, 277, 217, 206}

$$-\frac{8e^2\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{315d^3x^5}+\frac{4e\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{63d^2x^7}-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{9dx^9}-\frac{8be^4n\sqrt{d}}{315d^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] (-8*b*e^4*n*Sqrt[d + e*x^2])/(315*d^3*x) - (8*b*e^3*n*(d + e*x^2)^(3/2))/(9
45*d^3*x^3) - (8*b*e^2*n*(d + e*x^2)^(5/2))/(1575*d^3*x^5) - (b*n*(d + e*x^
2)^(7/2))/(81*d^2*x^9) + (50*b*e*n*(d + e*x^2)^(7/2))/(3969*d^3*x^7) + (8*b
*e^(9/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(315*d^3) - ((d + e*x^2)^(
5/2)*(a + b*Log[c*x^n]))/(9*d*x^9) + (4*e*(d + e*x^2)^(5/2)*(a + b*Log[c*x^
n]))/(63*d^2*x^7) - (8*e^2*(d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(315*d^3*x
^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
```

```
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{x^{10}}\,dx = -\frac{(d+ex^2)^{5/2}(a+b\log(cx^n))}{9dx^9} + \frac{4e(d+ex^2)^{5/2}(a+b\log(cx^n))}{63d^2x^7} - \frac{8e^2(}{}$$

$$= -\frac{(d+ex^2)^{5/2}(a+b\log(cx^n))}{9dx^9} + \frac{4e(d+ex^2)^{5/2}(a+b\log(cx^n))}{63d^2x^7} - \frac{8e^2(}{}$$

$$= -\frac{bn(d+ex^2)^{7/2}}{81d^2x^9} - \frac{(d+ex^2)^{5/2}(a+b\log(cx^n))}{9dx^9} + \frac{4e(d+ex^2)^{5/2}(a+b}{63d^2x^7}$$

$$= -\frac{bn(d+ex^2)^{7/2}}{81d^2x^9} + \frac{50ben(d+ex^2)^{7/2}}{3969d^3x^7} - \frac{(d+ex^2)^{5/2}(a+b\log(cx^n))}{9dx^9} +$$

$$= -\frac{8be^2n(d+ex^2)^{5/2}}{1575d^3x^5} - \frac{bn(d+ex^2)^{7/2}}{81d^2x^9} + \frac{50ben(d+ex^2)^{7/2}}{3969d^3x^7} - \frac{(d+ex^2)^{5}}{}$$

$$= -\frac{8be^3n(d+ex^2)^{3/2}}{945d^3x^3} - \frac{8be^2n(d+ex^2)^{5/2}}{1575d^3x^5} - \frac{bn(d+ex^2)^{7/2}}{81d^2x^9} + \frac{50ben(d+}{3969d}$$

$$= -\frac{8be^4n\sqrt{d+ex^2}}{315d^3x} - \frac{8be^3n(d+ex^2)^{3/2}}{945d^3x^3} - \frac{8be^2n(d+ex^2)^{5/2}}{1575d^3x^5} - \frac{bn(d+ex}{81d^2x}$$

$$= -\frac{8be^4n\sqrt{d+ex^2}}{315d^3x} - \frac{8be^3n(d+ex^2)^{3/2}}{945d^3x^3} - \frac{8be^2n(d+ex^2)^{5/2}}{1575d^3x^5} - \frac{bn(d+ex}{81d^2x}$$

$$= -\frac{8be^4n\sqrt{d+ex^2}}{315d^3x} - \frac{8be^3n(d+ex^2)^{3/2}}{945d^3x^3} - \frac{8be^2n(d+ex^2)^{5/2}}{1575d^3x^5} - \frac{bn(d+ex}{81d^2x}$$

Mathematica [A] time = 0.28, size = 178, normalized size = 0.70

$$-\frac{\sqrt{d+ex^2}\left(315a(35d^2-20dex^2+8e^2x^4)(d+ex^2)^2+bn(1225d^4+2425d^3ex^2+429d^2e^2x^4-677de^3x^6+26\right.}{99225d}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] -1/99225*(Sqrt[d + e*x^2]*(315*a*(d + e*x^2)^2*(35*d^2 - 20*d*e*x^2 + 8*e^2
*x^4) + b*n*(1225*d^4 + 2425*d^3*e*x^2 + 429*d^2*e^2*x^4 - 677*d*e^3*x^6 +
2614*e^4*x^8)) + 315*b*(d + e*x^2)^(5/2)*(35*d^2 - 20*d*e*x^2 + 8*e^2*x^4)*
Log[c*x^n] - 2520*b*e^(9/2)*n*x^9*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(d^3*
x^9)
```

fricas [A] time = 0.58, size = 526, normalized size = 2.05

$$\left[\frac{1260\,be^{\frac{9}{2}}nx^9\log\left(-2\,ex^2-2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)-\left(2\left(1307\,be^4n+1260\,ae^4\right)x^8-\left(677\,bde^3n+1260\,ade^3\right)x^6+\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^10,x, algorithm="fricas")
```

```
[Out] [1/99225*(1260*b*e^(9/2)*n*x^9*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x -
 d) - (2*(1307*b*e^4*n + 1260*a*e^4)*x^8 - (677*b*d*e^3*n + 1260*a*d*e^3)*x
^6 + 1225*b*d^4*n + 11025*a*d^4 + 3*(143*b*d^2*e^2*n + 315*a*d^2*e^2)*x^4 +
 25*(97*b*d^3*e*n + 630*a*d^3*e)*x^2 + 315*(8*b*e^4*x^8 - 4*b*d*e^3*x^6 + 3
```

```
*b*d^2*e^2*x^4 + 50*b*d^3*e*x^2 + 35*b*d^4)*log(c) + 315*(8*b*e^4*n*x^8 - 4
*b*d*e^3*n*x^6 + 3*b*d^2*e^2*n*x^4 + 50*b*d^3*e*n*x^2 + 35*b*d^4*n)*log(x))
*sqrt(e*x^2 + d))/(d^3*x^9), -1/99225*(2520*b*sqrt(-e)*e^4*n*x^9*arctan(sqr
t(-e)*x/sqrt(e*x^2 + d)) + (2*(1307*b*e^4*n + 1260*a*e^4)*x^8 - (677*b*d*e^
3*n + 1260*a*d*e^3)*x^6 + 1225*b*d^4*n + 11025*a*d^4 + 3*(143*b*d^2*e^2*n +
 315*a*d^2*e^2)*x^4 + 25*(97*b*d^3*e*n + 630*a*d^3*e)*x^2 + 315*(8*b*e^4*x^
8 - 4*b*d*e^3*x^6 + 3*b*d^2*e^2*x^4 + 50*b*d^3*e*x^2 + 35*b*d^4)*log(c) + 3
15*(8*b*e^4*n*x^8 - 4*b*d*e^3*n*x^6 + 3*b*d^2*e^2*n*x^4 + 50*b*d^3*e*n*x^2
+ 35*b*d^4*n)*log(x))*sqrt(e*x^2 + d))/(d^3*x^9)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^10,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^10, x)
```

maple [F] time = 0.51, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^2+d\right)^{\frac{3}{2}}\left(b\ln\left(c\,x^n\right)+a\right)}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^10,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(b*ln(c*x^n)+a)/x^10,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{315}a\left(\frac{8\left(ex^2+d\right)^{\frac{5}{2}}e^2}{d^3x^5}-\frac{20\left(ex^2+d\right)^{\frac{5}{2}}e}{d^2x^7}+\frac{35\left(ex^2+d\right)^{\frac{5}{2}}}{dx^9}\right)+b\int \frac{\left(ex^2\log(c)+d\log(c)+\left(ex^2+d\right)\log\left(x^n\right)\right)\sqrt{ex^2}}{x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^10,x, algorithm="maxima")
```

```
[Out] -1/315*a*(8*(e*x^2 + d)^(5/2)*e^2/(d^3*x^5) - 20*(e*x^2 + d)^(5/2)*e/(d^2*x
^7) + 35*(e*x^2 + d)^(5/2)/(d*x^9)) + b*integrate((e*x^2*log(c) + d*log(c)
+ (e*x^2 + d)*log(x^n))*sqrt(e*x^2 + d)/x^10, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(e\,x^2+d\right)^{3/2}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^10,x)
```

```
[Out] int(((d + e*x^2)^(3/2)*(a + b*log(c*x^n)))/x^10, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x**10,x)
```

```
[Out] Timed out
```

3.275 $\int x\sqrt{4+x^2}\,\log(x)\,dx$

Optimal. Leaf size=60

$$-\frac{1}{9}\left(x^2+4\right)^{3/2}-\frac{4\sqrt{x^2+4}}{3}+\frac{1}{3}\left(x^2+4\right)^{3/2}\log(x)+\frac{8}{3}\tanh^{-1}\left(\frac{\sqrt{x^2+4}}{2}\right)$$

```
[Out] -1/9*(x^2+4)^(3/2)+8/3*arctanh(1/2*(x^2+4)^(1/2))+1/3*(x^2+4)^(3/2)*ln(x)-4
/3*(x^2+4)^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {2338, 266, 50, 63, 207}

$$-\frac{1}{9}\left(x^2+4\right)^{3/2}-\frac{4\sqrt{x^2+4}}{3}+\frac{1}{3}\left(x^2+4\right)^{3/2}\log(x)+\frac{8}{3}\tanh^{-1}\left(\frac{\sqrt{x^2+4}}{2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[4 + x^2]*Log[x],x]
```

```
[Out] (-4*Sqrt[4 + x^2])/3 - (4 + x^2)^(3/2)/9 + (8*ArcTanh[Sqrt[4 + x^2]/2])/3 +
 ((4 + x^2)^(3/2)*Log[x])/3
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 207

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTanh[(Rt[b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (LtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
```

```
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int x\sqrt{4+x^2}\log(x)\,dx &= \frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)-\frac{1}{3}\int\frac{\left(4+x^2\right)^{3/2}}{x}\,dx\\
&= \frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)-\frac{1}{6}\operatorname{Subst}\left(\int\frac{(4+x)^{3/2}}{x}\,dx,x,x^2\right)\\
&= -\frac{1}{9}\left(4+x^2\right)^{3/2}+\frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)-\frac{2}{3}\operatorname{Subst}\left(\int\frac{\sqrt{4+x}}{x}\,dx,x,x^2\right)\\
&= -\frac{4}{3}\sqrt{4+x^2}-\frac{1}{9}\left(4+x^2\right)^{3/2}+\frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)-\frac{8}{3}\operatorname{Subst}\left(\int\frac{1}{x\sqrt{4+x}}\,dx,x,x^2\right)\\
&= -\frac{4}{3}\sqrt{4+x^2}-\frac{1}{9}\left(4+x^2\right)^{3/2}+\frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)-\frac{16}{3}\operatorname{Subst}\left(\int\frac{1}{-4+x^2}\,dx,x,\sqrt{4}\right.\\
&= -\frac{4}{3}\sqrt{4+x^2}-\frac{1}{9}\left(4+x^2\right)^{3/2}+\frac{8}{3}\tanh^{-1}\left(\frac{\sqrt{4+x^2}}{2}\right)+\frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)
\end{aligned}$$

Mathematica [A] time = 0.04, size = 53, normalized size = 0.88

$$\frac{1}{3}\left(-\frac{1}{3}\left(x^2+16\right)\sqrt{x^2+4}+\left(x^2+4\right)^{3/2}\log(x)+8\log\left(\sqrt{x^2+4}+2\right)-8\log(x)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[4 + x^2]*Log[x],x]
[Out] (-1/3*(Sqrt[4 + x^2]*(16 + x^2)) - 8*Log[x] + (4 + x^2)^(3/2)*Log[x] + 8*Lo
g[2 + Sqrt[4 + x^2]])/3
```

fricas [A] time = 0.42, size = 54, normalized size = 0.90

$$-\frac{1}{9}\left(x^2-3\left(x^2+4\right)\log(x)+16\right)\sqrt{x^2+4}+\frac{8}{3}\log\left(-x+\sqrt{x^2+4}+2\right)-\frac{8}{3}\log\left(-x+\sqrt{x^2+4}-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)*(x^2+4)^(1/2),x, algorithm="fricas")
[Out] -1/9*(x^2 - 3*(x^2 + 4)*log(x) + 16)*sqrt(x^2 + 4) + 8/3*log(-x + sqrt(x^2
+ 4) + 2) - 8/3*log(-x + sqrt(x^2 + 4) - 2)
```

giac [A] time = 0.32, size = 54, normalized size = 0.90

$$\frac{1}{3}\left(x^2+4\right)^{\frac{3}{2}}\log(x)-\frac{1}{9}\left(x^2+4\right)^{\frac{3}{2}}-\frac{4}{3}\sqrt{x^2+4}+\frac{4}{3}\log\left(\sqrt{x^2+4}+2\right)-\frac{4}{3}\log\left(\sqrt{x^2+4}-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)*(x^2+4)^(1/2),x, algorithm="giac")
[Out] 1/3*(x^2 + 4)^(3/2)*log(x) - 1/9*(x^2 + 4)^(3/2) - 4/3*sqrt(x^2 + 4) + 4/3*
log(sqrt(x^2 + 4) + 2) - 4/3*log(sqrt(x^2 + 4) - 2)
```

maple [A] time = 0.27, size = 75, normalized size = 1.25

$$\left(\frac{2\sqrt{\frac{x^2}{4}+1}\,\ln(x)}{3}-\frac{2\sqrt{\frac{x^2}{4}+1}}{9}\right)x^2+\left(-\frac{8}{3}+\frac{8\sqrt{\frac{x^2}{4}+1}}{3}\right)\ln(x)+\frac{8\ln\left(\frac{1}{2}+\frac{\sqrt{\frac{x^2}{4}+1}}{2}\right)}{3}+\frac{32}{9}-\frac{32\sqrt{\frac{x^2}{4}+1}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*ln(x)*(x^2+4)^(1/2),x)
```

```
[Out] (-2/9*(1+1/4*x^2)^(1/2)+2/3*ln(x)*(1+1/4*x^2)^(1/2))*x^2+32/9-32/9*(1+1/4*x
^2)^(1/2)+ln(x)*(-8/3+8/3*(1+1/4*x^2)^(1/2))+8/3*ln(1/2+1/2*(1+1/4*x^2)^(1/
2))
```

maxima [A] time = 1.30, size = 39, normalized size = 0.65

$$\frac{1}{3}\left(x^2+4\right)^{\frac{3}{2}}\log(x)-\frac{1}{9}\left(x^2+4\right)^{\frac{3}{2}}-\frac{4}{3}\sqrt{x^2+4}+\frac{8}{3}\operatorname{arsinh}\left(\frac{2}{|x|}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)*(x^2+4)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*(x^2 + 4)^(3/2)*log(x) - 1/9*(x^2 + 4)^(3/2) - 4/3*sqrt(x^2 + 4) + 8/3*
arcsinh(2/abs(x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\ln(x)\,\sqrt{x^2+4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*log(x)*(x^2 + 4)^(1/2),x)
```

```
[Out] int(x*log(x)*(x^2 + 4)^(1/2), x)
```

sympy [A] time = 25.55, size = 65, normalized size = 1.08

$$\frac{\left(x^2+4\right)^{\frac{3}{2}}\log(x)}{3}-\frac{\left(x^2+4\right)^{\frac{3}{2}}}{9}-\frac{4\sqrt{x^2+4}}{3}-\frac{4\log\left(\sqrt{x^2+4}-2\right)}{3}+\frac{4\log\left(\sqrt{x^2+4}+2\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*ln(x)*(x**2+4)**(1/2),x)
```

```
[Out] (x**2 + 4)**(3/2)*log(x)/3 - (x**2 + 4)**(3/2)/9 - 4*sqrt(x**2 + 4)/3 - 4*l
og(sqrt(x**2 + 4) - 2)/3 + 4*log(sqrt(x**2 + 4) + 2)/3
```

3.276 $\int \frac{x^5(a+b\log(cx^n))}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=182

$$\frac{d^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3}-\frac{2d(d+ex^2)^{3/2}(a+b\log(cx^n))}{3e^3}+\frac{(d+ex^2)^{5/2}(a+b\log(cx^n))}{5e^3}+\frac{8bd^{5/2}n\tanh^{-1}}{15e^3}$$

```
[Out] 7/45*b*d*n*(e*x^2+d)^(3/2)/e^3-1/25*b*n*(e*x^2+d)^(5/2)/e^3+8/15*b*d^(5/2)*
n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/e^3-2/3*d*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n)
)/e^3+1/5*(e*x^2+d)^(5/2)*(a+b*ln(c*x^n))/e^3-8/15*b*d^2*n*(e*x^2+d)^(1/2)/
e^3+d^2*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/e^3
```

Rubi [A] time = 0.23, antiderivative size = 182, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {266, 43, 2350, 12, 1251, 897, 1261, 208}

$$\frac{d^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3}-\frac{2d(d+ex^2)^{3/2}(a+b\log(cx^n))}{3e^3}+\frac{(d+ex^2)^{5/2}(a+b\log(cx^n))}{5e^3}-\frac{8bd^2n\sqrt{d+ex^2}}{15e^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] (-8*b*d^2*n*Sqrt[d + e*x^2])/(15*e^3) + (7*b*d*n*(d + e*x^2)^(3/2))/(45*e^3
) - (b*n*(d + e*x^2)^(5/2))/(25*e^3) + (8*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]])/(15*e^3) + (d^2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^3 - (2*d
*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) + ((d + e*x^2)^(5/2)*(a + b*
Log[c*x^n]))/(5*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
```

```
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^5\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d+ex^2}}\,dx = \frac{d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{2d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} + \frac{\left(d+ex^2\right)^{5/2}\left(a+b\right.}{5e^3}$$

$$= \frac{d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{2d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} + \frac{\left(d+ex^2\right)^{5/2}\left(a+b\right.}{5e^3}$$

$$= \frac{d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{2d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} + \frac{\left(d+ex^2\right)^{5/2}\left(a+b\right.}{5e^3}$$

$$= \frac{d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{2d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} + \frac{\left(d+ex^2\right)^{5/2}\left(a+b\right.}{5e^3}$$

$$= \frac{d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{2d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3} + \frac{\left(d+ex^2\right)^{5/2}\left(a+b\right.}{5e^3}$$

$$= -\frac{8bd^2n\sqrt{d+ex^2}}{15e^3} + \frac{7bdn\left(d+ex^2\right)^{3/2}}{45e^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25e^3} + \frac{d^2\sqrt{d+ex^2}\left(a+b\log\left(cx\right.\right.}{e^3}$$

$$= -\frac{8bd^2n\sqrt{d+ex^2}}{15e^3} + \frac{7bdn\left(d+ex^2\right)^{3/2}}{45e^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25e^3} + \frac{8bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{15e^3}$$

Mathematica [A] time = 0.21, size = 204, normalized size = 1.12

$$\frac{120ad^2\sqrt{d+ex^2}+45ae^2x^4\sqrt{d+ex^2}-60adex^2\sqrt{d+ex^2}+15b\sqrt{d+ex^2}\left(8d^2-4dex^2+3e^2x^4\right)\log\left(cx^n\right)+120b}{225e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] (120*a*d^2*Sqrt[d + e*x^2] - 94*b*d^2*n*Sqrt[d + e*x^2] - 60*a*d*e*x^2*Sqrt
[d + e*x^2] + 17*b*d*e*n*x^2*Sqrt[d + e*x^2] + 45*a*e^2*x^4*Sqrt[d + e*x^2]
 - 9*b*e^2*n*x^4*Sqrt[d + e*x^2] - 120*b*d^(5/2)*n*Log[x] + 15*b*Sqrt[d + e
*x^2]*(8*d^2 - 4*d*e*x^2 + 3*e^2*x^4)*Log[c*x^n] + 120*b*d^(5/2)*n*Log[d +
Sqrt[d]*Sqrt[d + e*x^2]])/(225*e^3)
```

fricas [A] time = 0.47, size = 314, normalized size = 1.73

$$\left[\frac{60\,bd^{\frac{5}{2}}n\log\left(-\frac{ex^2+2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right) - \left(9\left(be^2n-5\,ae^2\right)x^4 + 94\,bd^2n - 120\,ad^2 - (17\,bden-60\,ade)x^2 - 15\left(3\,be\right.\right.}{225\,e^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/225*(60*b*d^(5/2)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2)
- (9*(b*e^2*n - 5*a*e^2)*x^4 + 94*b*d^2*n - 120*a*d^2 - (17*b*d*e*n - 60*a*
d*e)*x^2 - 15*(3*b*e^2*x^4 - 4*b*d*e*x^2 + 8*b*d^2)*log(c) - 15*(3*b*e^2*n*
x^4 - 4*b*d*e*n*x^2 + 8*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/e^3, -1/225*(120*
b*sqrt(-d)*d^2*n*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (9*(b*e^2*n - 5*a*e^2)*
x^4 + 94*b*d^2*n - 120*a*d^2 - (17*b*d*e*n - 60*a*d*e)*x^2 - 15*(3*b*e^2*x^
4 - 4*b*d*e*x^2 + 8*b*d^2)*log(c) - 15*(3*b*e^2*n*x^4 - 4*b*d*e*n*x^2 + 8*b
*d^2*n)*log(x))*sqrt(e*x^2 + d))/e^3]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^5}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/sqrt(e*x^2 + d), x)
```

maple [F] time = 0.38, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)x^5}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(b*ln(c*x^n)+a)/(e*x^2+d)^(1/2),x)
```

```
[Out] int(x^5*(b*ln(c*x^n)+a)/(e*x^2+d)^(1/2),x)
```

maxima [A] time = 1.34, size = 206, normalized size = 1.13

$$-\frac{1}{225}\,bn\left(\frac{60\,d^{\frac{5}{2}}\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{e^3} + \frac{9\left(ex^2+d\right)^{\frac{5}{2}} - 35\left(ex^2+d\right)^{\frac{3}{2}}d + 120\,\sqrt{ex^2+d}\,d^2}{e^3}\right) + \frac{1}{15}\left(\frac{3\,\sqrt{ex^2+d}\,x^4}{e} - \frac{4}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/225*b*n*(60*d^(5/2)*log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + s
qrt(d)))/e^3 + (9*(e*x^2 + d)^(5/2) - 35*(e*x^2 + d)^(3/2)*d + 120*sqrt(e*x
^2 + d)*d^2)/e^3) + 1/15*(3*sqrt(e*x^2 + d)*x^4/e - 4*sqrt(e*x^2 + d)*d*x^2
/e^2 + 8*sqrt(e*x^2 + d)*d^2/e^3)*b*log(c*x^n) + 1/15*(3*sqrt(e*x^2 + d)*x^
4/e - 4*sqrt(e*x^2 + d)*d*x^2/e^2 + 8*sqrt(e*x^2 + d)*d^2/e^3)*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^5\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2)^(1/2),x)
```

```
[Out] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**5*(a + b*log(c*x**n))/sqrt(d + e*x**2), x)
```

3.277 $\int \frac{x^3(a+b\log(cx^n))}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=129

$$-\frac{d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}-\frac{2bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^2}+\frac{2bdn\sqrt{d+ex^2}}{3e^2}-\frac{bn(}{}$$

```
[Out] -1/9*b*n*(e*x^2+d)^(3/2)/e^2-2/3*b*d^(3/2)*n*arctanh((e*x^2+d)^(1/2)/d^(1/2
))/e^2+1/3*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/e^2+2/3*b*d*n*(e*x^2+d)^(1/2)/e^
2-d*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/e^2
```

Rubi [A] time = 0.16, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 43, 2350, 12, 446, 80, 50, 63, 208}

$$-\frac{d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}-\frac{2bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^2}+\frac{2bdn\sqrt{d+ex^2}}{3e^2}-\frac{bn(}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] (2*b*d*n*Sqrt[d + e*x^2])/(3*e^2) - (b*n*(d + e*x^2)^(3/2))/(9*e^2) - (2*b*
d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e^2) - (d*Sqrt[d + e*x^2]*(a
 + b*Log[c*x^n]))/e^2 + ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d+ex^2}}\,dx = -\frac{d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}-(bn)\int \frac{\left(-2d+ex^2\right)\ldots}{3e^2\ldots}$$

$$= -\frac{d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}-\frac{(bn)\int \frac{\left(-2d+ex^2\right)\sqrt{d+e\ldots}}{x}}{3e^2}$$

$$= -\frac{d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}-\frac{(bn)\,\mathrm{Subst}\left(\int \frac{(-2d+e\ldots}{\ldots}\right.}{6e^2\ldots}$$

$$= -\frac{bn\left(d+ex^2\right)^{3/2}}{9e^2}-\frac{d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}+\frac{(b\ldots}{\ldots}$$

$$= \frac{2bdn\sqrt{d+ex^2}}{3e^2}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e^2}-\frac{d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\ldots\right.}{3e^2}$$

$$= \frac{2bdn\sqrt{d+ex^2}}{3e^2}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e^2}-\frac{d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\ldots\right.}{3e^2}$$

$$= \frac{2bdn\sqrt{d+ex^2}}{3e^2}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e^2}-\frac{2bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^2}-\frac{d\sqrt{d+ex^2}\left(a+b\log\ldots\right.}{e^2}$$

Mathematica [A] time = 0.17, size = 145, normalized size = 1.12

$$\frac{3aex^2\sqrt{d+ex^2}-6ad\sqrt{d+ex^2}+3b\left(ex^2-2d\right)\sqrt{d+ex^2}\log\left(cx^n\right)-6bd^{3/2}n\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)+6bd^{3/2}n}{9e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
[Out] (-6*a*d*Sqrt[d + e*x^2] + 5*b*d*n*Sqrt[d + e*x^2] + 3*a*e*x^2*Sqrt[d + e*x^
2] - b*e*n*x^2*Sqrt[d + e*x^2] + 6*b*d^(3/2)*n*Log[x] + 3*b*(-2*d + e*x^2)*
Sqrt[d + e*x^2]*Log[c*x^n] - 6*b*d^(3/2)*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]]
)/(9*e^2)
```

fricas [A] time = 0.46, size = 207, normalized size = 1.60

$$\left[\frac{3\,bd^{\frac{3}{2}}n\log\left(-\frac{ex^2-2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right)+\left(5\,bdn-(ben-3\,ae)x^2-6\,ad+3\left(bex^2-2\,bd\right)\log(c)+3\left(benx^2-2\,bdn\right)\right.}{9\,e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="fricas")
[Out] [1/9*(3*b*d^(3/2)*n*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) + (
5*b*d*n - (b*e*n - 3*a*e)*x^2 - 6*a*d + 3*(b*e*x^2 - 2*b*d)*log(c) + 3*(b*e
*n*x^2 - 2*b*d*n)*log(x))*sqrt(e*x^2 + d))/e^2, 1/9*(6*b*sqrt(-d)*d*n*arcta
n(sqrt(-d)/sqrt(e*x^2 + d)) + (5*b*d*n - (b*e*n - 3*a*e)*x^2 - 6*a*d + 3*(b
*e*x^2 - 2*b*d)*log(c) + 3*(b*e*n*x^2 - 2*b*d*n)*log(x))*sqrt(e*x^2 + d))/e
^2]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x^3}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)*x^3/sqrt(e*x^2 + d), x)
```

maple [F] time = 0.36, size = 0, normalized size = 0.00

$$\int\frac{\left(b\ln\left(c\,x^n\right)+a\right)x^3}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(e*x^2+d)^(1/2),x)
[Out] int(x^3*(b*ln(c*x^n)+a)/(e*x^2+d)^(1/2),x)
```

maxima [A] time = 1.53, size = 149, normalized size = 1.16

$$\frac{1}{9}\,bn\left(\frac{3\,d^{\frac{3}{2}}\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{e^2}-\frac{\left(ex^2+d\right)^{\frac{3}{2}}-6\,\sqrt{ex^2+d}\,d}{e^2}\right)+\frac{1}{3}\left(\frac{\sqrt{ex^2+d}\,x^2}{e}-\frac{2\,\sqrt{ex^2+d}\,d}{e^2}\right)b\log\left(cx^n\right)+\frac{1}{3}\left(\sqrt{e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/9*b*n*(3*d^(3/2)*log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + sqrt(
d)))/e^2 - ((e*x^2 + d)^(3/2) - 6*sqrt(e*x^2 + d)*d)/e^2) + 1/3*(sqrt(e*x^2
 + d)*x^2/e - 2*sqrt(e*x^2 + d)*d/e^2)*b*log(c*x^n) + 1/3*(sqrt(e*x^2 + d)*
x^2/e - 2*sqrt(e*x^2 + d)*d/e^2)*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\ (a+b\ \ln(c\,x^n))}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x^2)^(1/2),x)
```

```
[Out] int((x^3*(a + b*log(c*x^n)))/(d + e*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))/sqrt(d + e*x**2), x)
```

3.278 $\int \frac{x\left(a+b\log(cx^n)\right)}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=73

$$\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{e}-\frac{bn\sqrt{d+ex^2}}{e}+\frac{b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e}$$

```
[Out] b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))*d^(1/2)/e-b*n*(e*x^2+d)^(1/2)/e+(a+b*l
n(c*x^n))*(e*x^2+d)^(1/2)/e
```

Rubi [A] time = 0.08, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2338, 266, 50, 63, 208}

$$\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{e}-\frac{bn\sqrt{d+ex^2}}{e}+\frac{b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] -((b*n*Sqrt[d + e*x^2])/e) + (b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])
/e + (Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
```

```
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d+ex^2}}\,dx &= \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e}-\frac{(bn)\int\frac{\sqrt{d+ex^2}}{x}\,dx}{e}\\
&= \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e}-\frac{(bn)\,\text{Subst}\left(\int\frac{\sqrt{d+ex}}{x}\,dx,x,x^2\right)}{2e}\\
&= -\frac{bn\sqrt{d+ex^2}}{e}+\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e}-\frac{(bdn)\,\text{Subst}\left(\int\frac{1}{x\sqrt{d+ex}}\,dx,x,x^2\right)}{2e}\\
&= -\frac{bn\sqrt{d+ex^2}}{e}+\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e}-\frac{(bdn)\,\text{Subst}\left(\int\frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ex^2}\right)}{e^2}\\
&= -\frac{bn\sqrt{d+ex^2}}{e}+\frac{b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e}+\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e}
\end{aligned}$$

Mathematica [A] time = 0.09, size = 91, normalized size = 1.25

$$\frac{a\sqrt{d+ex^2}+b\sqrt{d+ex^2}\log\left(cx^n\right)-bn\sqrt{d+ex^2}+b\sqrt{d}\,n\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)-b\sqrt{d}\,n\log(x)}{e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] (a*Sqrt[d + e*x^2] - b*n*Sqrt[d + e*x^2] - b*Sqrt[d]*n*Log[x] + b*Sqrt[d +
e*x^2]*Log[c*x^n] + b*Sqrt[d]*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/e
```

fricas [A] time = 0.44, size = 124, normalized size = 1.70

$$\left[\frac{b\sqrt{d}\,n\log\left(-\frac{ex^2+2\sqrt{ex^2+d}\sqrt{d}+2d}{x^2}\right)+2\sqrt{ex^2+d}\left(bn\log(x)-bn+b\log(c)+a\right)}{2e},-\frac{b\sqrt{-d}\,n\arctan\left(\frac{\sqrt{-d}}{\sqrt{ex^2+d}}\right)-\sqrt{ex^2+d}\left(bn\log(x)-bn+b\log(c)+a\right)}{e}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/2*(b*sqrt(d)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) + 2*s
qrt(e*x^2 + d)*(b*n*log(x) - b*n + b*log(c) + a))/e, -(b*sqrt(-d)*n*arctan(
sqrt(-d)/sqrt(e*x^2 + d)) - sqrt(e*x^2 + d)*(b*n*log(x) - b*n + b*log(c) +
a))/e]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)*x/sqrt(e*x^2 + d), x)
```

maple [F] time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n)+a)\,x}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x^2+d)^(1/2),x)
[Out] int(x*(b*ln(c*x^n)+a)/(e*x^2+d)^(1/2),x)
```

maxima [A] time = 0.67, size = 69, normalized size = 0.95

$$\frac{\left(\sqrt{d}\,\mathrm{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)-\sqrt{ex^2+d}\right)bn}{e}+\frac{\sqrt{ex^2+d}\,b\log(cx^n)}{e}+\frac{\sqrt{ex^2+d}\,a}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="maxima")
[Out] (sqrt(d)*arcsinh(d/(sqrt(d*e)*abs(x))) - sqrt(e*x^2 + d))*b*n/e + sqrt(e*x^
2 + d)*b*log(c*x^n)/e + sqrt(e*x^2 + d)*a/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\ln(c\,x^n)\right)}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x^2)^(1/2),x)
[Out] int((x*(a + b*log(c*x^n)))/(d + e*x^2)^(1/2), x)
```

sympy [A] time = 4.81, size = 126, normalized size = 1.73

$$a\left(\begin{cases}\frac{x^2}{2\sqrt{d}} & \text{for}\ e=0\\ \frac{\sqrt{d+ex^2}}{e} & \text{otherwise}\end{cases}\right)-bn\left(\begin{cases}\frac{x^2}{4\sqrt{d}} & \text{for}\ e=0\\ -\frac{\sqrt{d}\,\mathrm{asinh}\left(\frac{\sqrt{d}}{\sqrt{e}\,x}\right)}{e}+\frac{d}{e^{\frac{3}{2}}x\sqrt{\frac{d}{ex^2}+1}}+\frac{x}{\sqrt{e}\sqrt{\frac{d}{ex^2}+1}} & \text{otherwise}\end{cases}\right)+b\left(\begin{cases}\frac{x^2}{2\sqrt{d}} & \text{for}\ e=\\ \frac{\sqrt{d+ex^2}}{e} & \text{otherv}\end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d)**(1/2),x)
[Out] a*Piecewise((x**2/(2*sqrt(d)), Eq(e, 0)), (sqrt(d + e*x**2)/e, True)) - b*n
*Piecewise((x**2/(4*sqrt(d)), Eq(e, 0)), (-sqrt(d)*asinh(sqrt(d)/(sqrt(e)*x
))/e + d/(e**(3/2)*x*sqrt(d/(e*x**2) + 1)) + x/(sqrt(e)*sqrt(d/(e*x**2) + 1
)), True)) + b*Piecewise((x**2/(2*sqrt(d)), Eq(e, 0)), (sqrt(d + e*x**2)/e,
 True))*log(c*x**n)
```

3.279 $\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=166

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}-\frac{bn\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^2+d}}\right)}{2\sqrt{d}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}}-\frac{bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)\tanh^{-1}\left(\right.}{\sqrt{d}}$$

```
[Out] 1/2*b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))^2/d^(1/2)-arctanh((e*x^2+d)^(1/2)/
d^(1/2))*(a+b*ln(c*x^n))/d^(1/2)-b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))*ln(2*
d^(1/2)/(d^(1/2)-(e*x^2+d)^(1/2)))/d^(1/2)-1/2*b*n*polylog(2,1-2*d^(1/2)/(d
^(1/2)-(e*x^2+d)^(1/2)))/d^(1/2)
```

Rubi [A] time = 0.26, antiderivative size = 166, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 63, 208, 2348, 12, 5984, 5918, 2402, 2315}

$$-\frac{bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{2\sqrt{d}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}}-\frac{bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x^2]),x]
```

```
[Out] (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(2*Sqrt[d]) - (ArcTanh[Sqrt[d + e*
x^2]/Sqrt[d]]*(a + b*Log[c*x^n]))/Sqrt[d] - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sq
rt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/Sqrt[d] - (b*n*PolyLog
[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*Sqrt[d])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex^2}}\,dx = -\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} + (bn)\int \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}\,x}\,dx$$

$$= -\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} + \frac{(bn)\int \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{x}\,dx}{\sqrt{d}}$$

$$= -\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} + \frac{(bn)\,\text{Subst}\left(\int \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}\,dx, x, x^2\right)}{2\sqrt{d}}$$

$$= -\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} + \frac{(bn)\,\text{Subst}\left(\int \frac{x\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{-d+x^2}\,dx, x, \sqrt{d+ex^2}\right)}{\sqrt{d}}$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} - \frac{(bn)\,\text{Subst}\left(\int \frac{\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{1-\frac{x}{\sqrt{d}}}\,dx,\right.}{d}$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} - \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\log\left(\frac{}{\sqrt{d}-}\right.}{\sqrt{d}}$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} - \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\log\left(\frac{}{\sqrt{d}-}\right.}{\sqrt{d}}$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}} - \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\log\left(\frac{}{\sqrt{d}-}\right.}{\sqrt{d}}$$

Mathematica [C] time = 0.21, size = 162, normalized size = 0.98

$$\frac{bn\sqrt{\frac{d}{ex^2}+1}\left(-{}_3F_2\left(\frac{1}{2},\frac{1}{2},\frac{1}{2};\frac{3}{2},\frac{3}{2};-\frac{d}{ex^2}\right)-\frac{\sqrt{e}\,x\log(x)\sinh^{-1}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)}{\sqrt{d}}\right)}{\sqrt{d+ex^2}}+\frac{\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)\left(-a-b\left(\log(cx^n)-n\log\right.\right.}{\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x^2]),x]
```

```
[Out] (b*n*Sqrt[1 + d/(e*x^2)]*(-HypergeometricPFQ[{1/2, 1/2, 1/2}, {3/2, 3/2}, -
(d/(e*x^2))] - (Sqrt[e]*x*ArcSinh[Sqrt[d]/(Sqrt[e]*x)]*Log[x])/Sqrt[d]))/Sq
rt[d + e*x^2] - (Log[x]*(-a - b*(-(n*Log[x]) + Log[c*x^n])))/Sqrt[d] + ((-a
 - b*(-(n*Log[x]) + Log[c*x^n]))*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/Sqrt[d]
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,b\log(cx^n)+\sqrt{ex^2+d}\,a}{ex^3+dx}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e*x^3 + d*x),
x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b \log\left(cx^{n}\right) + a}{\sqrt{ex^{2} + d}\, x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^2 + d)*x), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{b \ln\left(c\, x^{n}\right) + a}{\sqrt{e\, x^{2} + d}\; x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^2+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x/(e*x^2+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b \int \frac{\log(c) + \log\left(x^{n}\right)}{\sqrt{ex^{2} + d}\, x}\, dx - \frac{a \operatorname{arsinh}\left(\frac{d}{\sqrt{de}\, |x|}\right)}{\sqrt{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] b*integrate((log(c) + log(x^n))/(sqrt(e*x^2 + d)*x), x) - a*arcsinh(d/(sqrt
(d*e)*abs(x)))/sqrt(d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\, \ln\left(c\, x^{n}\right)}{x\, \sqrt{e\, x^{2} + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^2)^(1/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \log\left(cx^{n}\right)}{x \sqrt{d + ex^{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x*sqrt(d + e*x**2)), x)
```

3.280 $\int \frac{a+b\log(cx^n)}{x^3\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=258

$$\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^{3/2}}-\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2dx^2}+\frac{ben\mathrm{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^2+d}}\right)}{4d^{3/2}}-\frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{3/2}}$$

```
[Out] -1/4*b*e*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(3/2)-1/4*b*e*n*arctanh((e*x^
2+d)^(1/2)/d^(1/2))^2/d^(3/2)+1/2*e*arctanh((e*x^2+d)^(1/2)/d^(1/2))*(a+b*l
n(c*x^n))/d^(3/2)+1/2*b*e*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(
d^(1/2)-(e*x^2+d)^(1/2)))/d^(3/2)+1/4*b*e*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-
(e*x^2+d)^(1/2)))/d^(3/2)-1/4*b*n*(e*x^2+d)^(1/2)/d/x^2-1/2*(a+b*ln(c*x^n))
*(e*x^2+d)^(1/2)/d/x^2
```

Rubi [A] time = 0.37, antiderivative size = 258, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {266, 51, 63, 208, 2350, 12, 14, 47, 5984, 5918, 2402, 2315}

$$\frac{ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4d^{3/2}}+\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^{3/2}}-\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2dx^2}-\frac{ben\tanh^{-1}\left(\dots\right.}{4d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*Sqrt[d + e*x^2]),x]
```

```
[Out] -(b*n*Sqrt[d + e*x^2])/(4*d*x^2) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])
/(4*d^(3/2)) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(4*d^(3/2)) - (Sq
rt[d + e*x^2]*(a + b*Log[c*x^n]))/(2*d*x^2) + (e*ArcTanh[Sqrt[d + e*x^2]/Sq
rt[d]]*(a + b*Log[c*x^n]))/(2*d^(3/2)) + (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqr
t[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(3/2)) + (b*e*n*Po
lyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*d^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
```

```
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\sqrt{d+ex^2}}\,dx = -\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{2d^{3/2}} - (bn)\int \frac{-\frac{\sqrt{d+ex^2}}{d} + \cdots}{\cdots}$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{2d^{3/2}} - \frac{1}{2}(bn)\int \frac{-\frac{\sqrt{d+ex^2}}{d} + \cdots}{\cdots}$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{2d^{3/2}} - \frac{1}{2}(bn)\int\left(-\frac{\sqrt{d+ex^2}}{dx^3} \cdots\right.$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{2d^{3/2}} + \frac{(bn)\int \frac{\sqrt{d+ex^2}}{x^3}dx}{2d} - \cdots$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{2d^{3/2}} + \frac{(bn)\,\text{Subst}\left(\int \frac{\sqrt{d+ex \cdots}}{x^2} \cdots\right.}{4d}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4dx^2} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{2d^{3/2}} - \frac{(ben \cdots}{\cdots}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4dx^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\cdots}{2d\cdots}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4dx^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx \cdots\right.}{2dx^2}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4dx^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx \cdots\right.}{2dx^2}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4dx^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx \cdots\right.}{2dx^2}$$

Mathematica [C] time = 1.10, size = 229, normalized size = 0.89

$$\frac{\frac{bn\sqrt{\frac{d}{ex^2}+1}\left(2d^{3/2}\,{}_3F_2\left(\frac{3}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};-\frac{d}{ex^2}\right)+9ex^2(2\log(x)+1)\left(\sqrt{e}\,x\sinh^{-1}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)-\sqrt{d}\sqrt{\frac{d}{ex^2}+1}\right)\right)}{x^2\sqrt{d+ex^2}} - \frac{18\sqrt{d}\sqrt{d+ex^2}\left(a+b\log(cx^n)-bn\log(x)\right)}{x^2} + 18e\,\text{lo}\cdots}{36d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*Sqrt[d + e*x^2]),x]
```

```
[Out] ((b*n*Sqrt[1 + d/(e*x^2)]*(2*d^(3/2)*HypergeometricPFQ[{3/2, 3/2, 3/2}, {5/
2, 5/2}, -(d/(e*x^2))] + 9*e*x^2*(-(Sqrt[d]*Sqrt[1 + d/(e*x^2)]) + Sqrt[e]*
x*ArcSinh[Sqrt[d]/(Sqrt[e]*x)])*(1 + 2*Log[x])))/(x^2*Sqrt[d + e*x^2]) - (1
```

```
8*Sqrt[d]*Sqrt[d + e*x^2]*(a - b*n*Log[x] + b*Log[c*x^n]))/x^2 - 18*e*Log[x
]*(a - b*n*Log[x] + b*Log[c*x^n]) + 18*e*(a - b*n*Log[x] + b*Log[c*x^n])*Lo
g[d + Sqrt[d]*Sqrt[d + e*x^2]])/(36*d^(3/2))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,b\log\left(cx^n\right)+\sqrt{ex^2+d}\,a}{ex^5+dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e*x^5 + d*x^3)
, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\sqrt{ex^2+d}\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^2 + d)*x^3), x)
```

maple [F] time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right)+a}{\sqrt{e\,x^2+d}\;x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(e*x^2+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^3/(e*x^2+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}a\left(\frac{e\,\text{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{d^{\frac{3}{2}}}-\frac{\sqrt{ex^2+d}}{dx^2}\right)+b\int \frac{\log(c)+\log\left(x^n\right)}{\sqrt{ex^2+d}\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*a*(e*arcsinh(d/(sqrt(d*e)*abs(x)))/d^(3/2) - sqrt(e*x^2 + d)/(d*x^2)) +
 b*integrate((log(c) + log(x^n))/(sqrt(e*x^2 + d)*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)^(1/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\log(cx^n)}{x^3\sqrt{d + ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**3*sqrt(d + e*x**2)), x)
```

3.281 $\int \frac{x^2(a+b\log(cx^n))}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=359

$$-\frac{d^{3/2}\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{3/2}\sqrt{d+ex^2}}+\frac{x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e}+\frac{bd^{3/2}n\sqrt{\frac{ex^2}{d}+1}\,\mathrm{Li}_2\left(e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right.}{4e^{3/2}\sqrt{d+ex^2}}$$

```
[Out] -1/4*b*n*x*(e*x^2+d)^(1/2)/e+1/2*x*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/e-1/4*b*
d^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*(1+e*x^2/d)^(1/2)/e^(3/2)/(e*x^2+d)^(1
/2)-1/4*b*d^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))^2*(1+e*x^2/d)^(1/2)/e^(3/2)/
(e*x^2+d)^(1/2)+1/2*b*d^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*ln(1-(x*e^(1/2)/
d^(1/2)+(1+e*x^2/d)^(1/2))^2)*(1+e*x^2/d)^(1/2)/e^(3/2)/(e*x^2+d)^(1/2)-1/2
*d^(3/2)*arcsinh(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*(1+e*x^2/d)^(1/2)/e^(3/
2)/(e*x^2+d)^(1/2)+1/4*b*d^(3/2)*n*polylog(2,(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)
^(1/2))^2)*(1+e*x^2/d)^(1/2)/e^(3/2)/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.41, antiderivative size = 359, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {2341, 321, 215, 2350, 12, 14, 195, 5659, 3716, 2190, 2279, 2391}

$$\frac{bd^{3/2}n\sqrt{\frac{ex^2}{d}+1}\,\mathrm{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4e^{3/2}\sqrt{d+ex^2}}-\frac{d^{3/2}\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{3/2}\sqrt{d+ex^2}}+\frac{x\sqrt{d+ex^2}\left(a+b\log\right.}{2e}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] -(b*n*x*Sqrt[d + e*x^2])/(4*e) - (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]])/(4*e^(3/2)*Sqrt[d + e*x^2]) - (b*d^(3/2)*n*Sqrt[1 + (e
*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(4*e^(3/2)*Sqrt[d + e*x^2]) + (b*d
^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcS
inh[(Sqrt[e]*x)/Sqrt[d]])])/(2*e^(3/2)*Sqrt[d + e*x^2]) + (x*Sqrt[d + e*x^2
]*(a + b*Log[c*x^n]))/(2*e) - (d^(3/2)*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]
*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*e^(3/2)*Sqrt[d + e*x^2]) + (b*d^(3/2)*n
*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(4*e^(
3/2)*Sqrt[d + e*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d+ex^2}}\,dx = \frac{\sqrt{1+\frac{ex^2}{d}}\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\sqrt{1+\frac{ex^2}{d}}}\,dx}{\sqrt{d+ex^2}}$$

$$= \frac{x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e} - \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{3/2}\sqrt{d+ex^2}} - \frac{(bn}{}$$

$$= \frac{x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e} - \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{3/2}\sqrt{d+ex^2}} - \frac{(bn}{}$$

$$= \frac{x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e} - \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{3/2}\sqrt{d+ex^2}} - \frac{(bn}{}$$

$$= \frac{x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e} - \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{3/2}\sqrt{d+ex^2}} + \frac{(bd}{}$$

$$= -\frac{bnx\sqrt{d+ex^2}}{4e} + \frac{x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e} - \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+}{2e^{3/2}\sqrt{d+ex^2}}$$

$$= -\frac{bnx\sqrt{d+ex^2}}{4e} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4e^{3/2}\sqrt{d+ex^2}} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{3/2}\sqrt{d+ex^2}}$$

$$= -\frac{bnx\sqrt{d+ex^2}}{4e} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4e^{3/2}\sqrt{d+ex^2}} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{3/2}\sqrt{d+ex^2}}$$

$$= -\frac{bnx\sqrt{d+ex^2}}{4e} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4e^{3/2}\sqrt{d+ex^2}} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{3/2}\sqrt{d+ex^2}}$$

$$= -\frac{bnx\sqrt{d+ex^2}}{4e} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4e^{3/2}\sqrt{d+ex^2}} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{3/2}\sqrt{d+ex^2}}$$

Mathematica [C] time = 0.79, size = 205, normalized size = 0.57

$$\frac{\frac{bn\sqrt{\frac{ex^2}{d}+1}\left(2e^2x^3\,{}_3F_2\left(\frac{3}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};-\frac{ex^2}{d}\right)+9d\sqrt{e}(2\log(x)-1)\left(\sqrt{e}x\sqrt{\frac{ex^2}{d}+1}-\sqrt{d}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\right)\right)}{\sqrt{d+ex^2}}+18ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)-b\right.}{36e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] ((b*n*Sqrt[1 + (e*x^2)/d]*(2*e^2*x^3*HypergeometricPFQ[{3/2, 3/2, 3/2}, {5/
2, 5/2}, -((e*x^2)/d)] + 9*d*Sqrt[e]*(Sqrt[e]*x*Sqrt[1 + (e*x^2)/d] - Sqrt[
d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])*(-1 + 2*Log[x])))/Sqrt[d + e*x^2] + 18*e*x
*Sqrt[d + e*x^2]*(a - b*n*Log[x] + b*Log[c*x^n]) - 18*d*Sqrt[e]*(a - b*n*Lo
g[x] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(36*e^2)
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,bx^2\log(cx^n)+\sqrt{ex^2+d}\,ax^2}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*x^2*log(c*x^n) + sqrt(e*x^2 + d)*a*x^2)/(e*x^2
+ d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log(cx^n)+a\right)x^2}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/sqrt(e*x^2 + d), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n)+a)\,x^2}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(e*x^2+d)^(1/2),x)
```

```
[Out] int(x^2*(b*ln(c*x^n)+a)/(e*x^2+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}a\left(\frac{\sqrt{ex^2+d}\,x}{e}-\frac{d\,\mathrm{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{e^{\frac{3}{2}}}\right)+b\int\frac{x^2\log(c)+x^2\log(x^n)}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*a*(sqrt(e*x^2 + d)*x/e - d*arcsinh(e*x/sqrt(d*e))/e^(3/2)) + b*integrat
e((x^2*log(c) + x^2*log(x^n))/sqrt(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,\left(a+b\,\ln(c\,x^n)\right)}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2)^(1/2),x)
[Out] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \left(a + b \log \left(cx^n\right)\right)}{\sqrt{d + ex^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x**2+d)**(1/2),x)
[Out] Integral(x**2*(a + b*log(c*x**n))/sqrt(d + e*x**2), x)
```

3.282 $\int \frac{a+b\log(cx^n)}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=250

$$\frac{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{e}\sqrt{d+ex^2}}-\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\,\mathrm{Li}_2\left(e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2\sqrt{e}\sqrt{d+ex^2}}+\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{e}\sqrt{d+ex^2}}-$$

```
[Out] 1/2*b*n*arcsinh(x*e^(1/2)/d^(1/2))^2*d^(1/2)*(1+e*x^2/d)^(1/2)/e^(1/2)/(e*x
^2+d)^(1/2)-b*n*arcsinh(x*e^(1/2)/d^(1/2))*ln(1-(x*e^(1/2)/d^(1/2)+(1+e*x^2
/d)^(1/2))^2)*d^(1/2)*(1+e*x^2/d)^(1/2)/e^(1/2)/(e*x^2+d)^(1/2)+arcsinh(x*e
^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*d^(1/2)*(1+e*x^2/d)^(1/2)/e^(1/2)/(e*x^2+d)
^(1/2)-1/2*b*n*polylog(2,(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*d^(1/2)*(
1+e*x^2/d)^(1/2)/e^(1/2)/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.318$, Rules used = {2327, 2325, 5659, 3716, 2190, 2279, 2391}

$$-\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\,\mathrm{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2\sqrt{e}\sqrt{d+ex^2}}+\frac{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{e}\sqrt{d+ex^2}}+\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}}{2\sqrt{e}\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/Sqrt[d + e*x^2],x]
```

```
[Out] (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(2*Sqrt[e]
*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sq
rt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(Sqrt[e]*Sqrt[d + e*x^2
]) + (Sqrt[d]*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c
*x^n]))/(Sqrt[e]*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*PolyLo
g[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[e]*Sqrt[d + e*x^2])
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2325

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[e, 2], x]
 - Dist[(b*n)/Rt[e, 2], Int[ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]/x, x], x] /; Free
Q[{a, b, c, d, e, n}, x] && GtQ[d, 0] && PosQ[e]
```

Rule 2327

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Dist[Sqrt[1 + (e*x^2)/d]/Sqrt[d + e*x^2], Int[(a + b*Log[c*x^n])/Sqr
```

```
t[1 + (e*x^2)/d], x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&  !GtQ[d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{\sqrt{d+ex^2}}\,dx = \frac{\sqrt{1+\frac{ex^2}{d}}\int \frac{a+b\log(cx^n)}{\sqrt{1+\frac{ex^2}{d}}}\,dx}{\sqrt{d+ex^2}}$$

$$= \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{e}\sqrt{d+ex^2}} - \frac{\left(b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\right)\int \frac{\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{\sqrt{e}\sqrt{d+ex^2}}$$

$$= \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{e}\sqrt{d+ex^2}} - \frac{\left(b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\right)\text{Subst}\left(\int x\coth(x)\,d\right.}{\sqrt{e}\sqrt{d+ex^2}}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{e}\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{e}\sqrt{d+ex^2}} + \frac{\left(2b\sqrt{\right.}{}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{e}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\log\left(1-e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{\sqrt{e}\sqrt{d+ex^2}}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{e}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\log\left(1-e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{\sqrt{e}\sqrt{d+ex^2}}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{e}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\log\left(1-e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{\sqrt{e}\sqrt{d+ex^2}}$$

Mathematica [A] time = 0.61, size = 186, normalized size = 0.74

$$\frac{\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)\left(a+b\log(cx^n)-bn\log(x)\right)}{\sqrt{e}} + \frac{bn\sqrt{\frac{ex^2}{d}+1}\left(\text{Li}_2\left(e^{-2\sinh^{-1}\left(\sqrt{\frac{e}{d}}x\right)}\right)+2\log(x)\log\left(\sqrt{\frac{ex^2}{d}}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/Sqrt[d + e*x^2],x]
```

```
[Out] ((a - b*n*Log[x] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/Sqrt[e
] + (b*n*Sqrt[1 + (e*x^2)/d]*(-ArcSinh[Sqrt[e/d]*x]^2 - 2*ArcSinh[Sqrt[e/d]
*x]*Log[1 - E^(-2*ArcSinh[Sqrt[e/d]*x])] + 2*Log[x]*Log[Sqrt[e/d]*x + Sqrt[
1 + (e*x^2)/d]] + PolyLog[2, E^(-2*ArcSinh[Sqrt[e/d]*x])]))/(2*Sqrt[e/d]*Sq
rt[d + e*x^2])
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,b\log\left(cx^n\right)+\sqrt{ex^2+d}\,a}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/sqrt(e*x^2 + d), x)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right)+a}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x^2+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/(e*x^2+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b\int \frac{\log\left(c\right)+\log\left(x^n\right)}{\sqrt{ex^2+d}}\,dx+\frac{a\,\mathrm{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{e}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] b*integrate((log(c) + log(x^n))/sqrt(e*x^2 + d), x) + a*arcsinh(e*x/sqrt(d*
e))/sqrt(e)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x^2)^(1/2),x)
[Out] int((a + b*log(c*x^n))/(d + e*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\log(cx^n)}{\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x**2+d)**(1/2),x)
[Out] Integral((a + b*log(c*x**n))/sqrt(d + e*x**2), x)
```

3.283 $\int \frac{a+b\log(cx^n)}{x^2\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=81

$$-\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{dx}-\frac{bn\sqrt{d+ex^2}}{dx}+\frac{b\sqrt{e}\,n\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{d}$$

```
[Out] b*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))*e^(1/2)/d-b*n*(e*x^2+d)^(1/2)/d/x-(a
+b*ln(c*x^n))*(e*x^2+d)^(1/2)/d/x
```

Rubi [A] time = 0.09, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2335, 277, 217, 206}

$$-\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{dx}-\frac{bn\sqrt{d+ex^2}}{dx}+\frac{b\sqrt{e}\,n\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*Sqrt[d + e*x^2]),x]
```

```
[Out] -((b*n*Sqrt[d + e*x^2])/(d*x)) + (b*Sqrt[e]*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d +
e*x^2]])/d - (Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(d*x)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2\sqrt{d+ex^2}}dx = -\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{dx} + \frac{(bn)\int \frac{\sqrt{d+ex^2}}{x^2}dx}{d}$$
$$= -\frac{bn\sqrt{d+ex^2}}{dx} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{dx} + \frac{(ben)\int \frac{1}{\sqrt{d+ex^2}}dx}{d}$$
$$= -\frac{bn\sqrt{d+ex^2}}{dx} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{dx} + \frac{(ben)\,\text{Subst}\left(\int \frac{1}{1-ex^2}dx, x, \frac{x}{\sqrt{d+ex^2}}\right)}{d}$$
$$= -\frac{bn\sqrt{d+ex^2}}{dx} + \frac{b\sqrt{e}\,n\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{d} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{dx}$$

Mathematica [A] time = 0.11, size = 77, normalized size = 0.95

$$\frac{(a+bn)\left(-\sqrt{d+ex^2}\right) - b\sqrt{d+ex^2}\,\log(cx^n) + b\sqrt{e}\,nx\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{dx}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*Sqrt[d + e*x^2]),x]
```

```
[Out] (-((a + b*n)*Sqrt[d + e*x^2]) - b*Sqrt[d + e*x^2]*Log[c*x^n] + b*Sqrt[e]*n*
x*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(d*x)
```

fricas [A] time = 0.45, size = 127, normalized size = 1.57

$$\left[\frac{b\sqrt{e}\,nx\log\left(-2\,ex^2 - 2\,\sqrt{ex^2+d}\,\sqrt{e}\,x - d\right) - 2\,\sqrt{ex^2+d}\left(bn\log(x) + bn + b\log(c) + a\right)}{2\,dx}, -\frac{b\sqrt{-e}\,nx\arctan\left(\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/2*(b*sqrt(e)*n*x*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) - 2*sqr
t(e*x^2 + d)*(b*n*log(x) + b*n + b*log(c) + a))/(d*x), -(b*sqrt(-e)*n*x*arc
tan(sqrt(-e)*x/sqrt(e*x^2 + d)) + sqrt(e*x^2 + d)*(b*n*log(x) + b*n + b*log
(c) + a))/(d*x)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n) + a}{\sqrt{ex^2+d}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^2 + d)*x^2), x)
```

maple [F] time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{b\ln(c\,x^n) + a}{\sqrt{e\,x^2+d}\;x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(e*x^2+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^2/(e*x^2+d)^(1/2),x)
```

maxima [A] time = 0.71, size = 77, normalized size = 0.95

$$\frac{\left(\sqrt{e}\,\operatorname{arsinh}\left(\frac{ex}{\sqrt{de}}\right)-\frac{\sqrt{ex^2+d}}{x}\right)bn}{d}-\frac{\sqrt{ex^2+d}\,b\log\left(cx^n\right)}{dx}-\frac{\sqrt{ex^2+d}\,a}{dx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] (sqrt(e)*arcsinh(e*x/sqrt(d*e)) - sqrt(e*x^2 + d)/x)*b*n/d - sqrt(e*x^2 + d
)*b*log(c*x^n)/(d*x) - sqrt(e*x^2 + d)*a/(d*x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^2\,\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)^(1/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\log\left(cx^n\right)}{x^2\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**2*sqrt(d + e*x**2)), x)
```

3.284 $\int \frac{a+b\log(cx^n)}{x^4\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=144

$$\frac{2e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3d^2x}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3dx^3}-\frac{2be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2}+\frac{2ben\sqrt{d+ex^2}}{3d^2x}-\frac{bn\left(d+\right.}{9d^2}$$

```
[Out] -1/9*b*n*(e*x^2+d)^(3/2)/d^2/x^3-2/3*b*e^(3/2)*n*arctanh(x*e^(1/2)/(e*x^2+d
)^(1/2))/d^2+2/3*b*e*n*(e*x^2+d)^(1/2)/d^2/x-1/3*(a+b*ln(c*x^n))*(e*x^2+d)^
(1/2)/d/x^3+2/3*e*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/d^2/x
```

Rubi [A] time = 0.13, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {271, 264, 2350, 12, 451, 277, 217, 206}

$$\frac{2e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3d^2x}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3dx^3}-\frac{2be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2}+\frac{2ben\sqrt{d+ex^2}}{3d^2x}-\frac{bn\left(d+\right.}{9d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*Sqrt[d + e*x^2]),x]
```

```
[Out] (2*b*e*n*Sqrt[d + e*x^2])/(3*d^2*x) - (b*n*(d + e*x^2)^(3/2))/(9*d^2*x^3) -
 (2*b*e^(3/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d^2) - (Sqrt[d + e
*x^2]*(a + b*Log[c*x^n]))/(3*d*x^3) + (2*e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n
]))/(3*d^2*x)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx^n)}{x^4\sqrt{d+ex^2}}\,dx &= -\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{3d^2x}-(bn)\int\frac{\sqrt{d+ex^2}\left(-d+2e\right.}{3d^2x^4} \\
&= -\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{3d^2x}-\frac{(bn)\int\frac{\sqrt{d+ex^2}\left(-d+2ex^2\right)}{x^4}\,dx}{3d^2} \\
&= -\frac{bn\left(d+ex^2\right)^{3/2}}{9d^2x^3}-\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{3d^2x}-\frac{(2ben)\int}{} \\
&= \frac{2ben\sqrt{d+ex^2}}{3d^2x}-\frac{bn\left(d+ex^2\right)^{3/2}}{9d^2x^3}-\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\log(\right.}{3d^2x} \\
&= \frac{2ben\sqrt{d+ex^2}}{3d^2x}-\frac{bn\left(d+ex^2\right)^{3/2}}{9d^2x^3}-\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\log(\right.}{3d^2x} \\
&= \frac{2ben\sqrt{d+ex^2}}{3d^2x}-\frac{bn\left(d+ex^2\right)^{3/2}}{9d^2x^3}-\frac{2be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2}-\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{3dx^3}
\end{aligned}$$

Mathematica [A] time = 0.15, size = 110, normalized size = 0.76

$$\frac{\sqrt{d+ex^2}\left(-3ad+6aex^2-bdn+5benx^2\right)-3b\left(d-2ex^2\right)\sqrt{d+ex^2}\log(cx^n)-6be^{3/2}nx^3\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right.}{9d^2x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*Sqrt[d + e*x^2]),x]
```

```
[Out] (Sqrt[d + e*x^2]*(-3*a*d - b*d*n + 6*a*e*x^2 + 5*b*e*n*x^2) - 3*b*(d - 2*e*
x^2)*Sqrt[d + e*x^2]*Log[c*x^n] - 6*b*e^(3/2)*n*x^3*Log[e*x + Sqrt[e]*Sqrt[
d + e*x^2]])/(9*d^2*x^3)
```

fricas [A] time = 0.45, size = 223, normalized size = 1.55

$$\left[\frac{3\,be^{\frac{3}{2}}nx^3\log\left(-2\,ex^2+2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)-\left(bdn-(5\,ben+6\,ae)x^2+3\,ad-3\left(2\,bex^2-bd\right)\log(c)-3\left(2\,b\right.\right.}{9\,d^2x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/9*(3*b*e^(3/2)*n*x^3*log(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) - (
b*d*n - (5*b*e*n + 6*a*e)*x^2 + 3*a*d - 3*(2*b*e*x^2 - b*d)*log(c) - 3*(2*b
*e*n*x^2 - b*d*n)*log(x))*sqrt(e*x^2 + d))/(d^2*x^3), 1/9*(6*b*sqrt(-e)*e*n
*x^3*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) - (b*d*n - (5*b*e*n + 6*a*e)*x^2 +
3*a*d - 3*(2*b*e*x^2 - b*d)*log(c) - 3*(2*b*e*n*x^2 - b*d*n)*log(x))*sqrt(e
*x^2 + d))/(d^2*x^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{\sqrt{ex^2+d}\,x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^2 + d)*x^4), x)
```

maple [F] time = 0.39, size = 0, normalized size = 0.00

$$\int \frac{b\ln(c\,x^n)+a}{\sqrt{e\,x^2+d}\;x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^4/(e*x^2+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^4/(e*x^2+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\,a\left(\frac{2\,\sqrt{ex^2+d}\,e}{d^2x}-\frac{\sqrt{ex^2+d}}{dx^3}\right)+b\int \frac{\log(c)+\log(x^n)}{\sqrt{ex^2+d}\,x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(2*sqrt(e*x^2 + d)*e/(d^2*x) - sqrt(e*x^2 + d)/(d*x^3)) + b*integrate
((log(c) + log(x^n))/(sqrt(e*x^2 + d)*x^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln(c\,x^n)}{x^4\,\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)^(1/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \log(cx^n)}{x^4 \sqrt{d + ex^2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**4*sqrt(d + e*x**2)), x)
```

3.285 $\int \frac{a+b\log(cx^n)}{x^6\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=204

$$-\frac{8e^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{15d^3x}+\frac{4e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{15d^2x^3}-\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5}+\frac{8be^{5/2}n\tanh^{-1}\left(\right.}{15d^3}$$

```
[Out] -1/25*b*n*(e*x^2+d)^(3/2)/d^2/x^5+26/225*b*e*n*(e*x^2+d)^(3/2)/d^3/x^3+8/15
*b*e^(5/2)*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/d^3-8/15*b*e^2*n*(e*x^2+d)^
(1/2)/d^3/x-1/5*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/d/x^5+4/15*e*(a+b*ln(c*x^n)
)*(e*x^2+d)^(1/2)/d^2/x^3-8/15*e^2*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/d^3/x
```

Rubi [A] time = 0.18, antiderivative size = 204, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {271, 264, 2350, 12, 1265, 451, 277, 217, 206}

$$-\frac{8e^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{15d^3x}+\frac{4e\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{15d^2x^3}-\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{5dx^5}-\frac{8be^2n\sqrt{d+ex^2}}{15d^3x}+$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^6*Sqrt[d + e*x^2]),x]
```

```
[Out] (-8*b*e^2*n*Sqrt[d + e*x^2])/(15*d^3*x) - (b*n*(d + e*x^2)^(3/2))/(25*d^2*x
^5) + (26*b*e*n*(d + e*x^2)^(3/2))/(225*d^3*x^3) + (8*b*e^(5/2)*n*ArcTanh[(
Sqrt[e]*x)/Sqrt[d + e*x^2]])/(15*d^3) - (Sqrt[d + e*x^2]*(a + b*Log[c*x^n])
)/(5*d*x^5) + (4*e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(15*d^2*x^3) - (8*e^
2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(15*d^3*x)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^6\sqrt{d+ex^2}}\,dx = -\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{5dx^5} + \frac{4e\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{15d^2x^3} - \frac{8e^2\sqrt{d+ex^2}\left(a+b\log(c\right.}{15d^3x}$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{5dx^5} + \frac{4e\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{15d^2x^3} - \frac{8e^2\sqrt{d+ex^2}\left(a+b\log(c\right.}{15d^3x}$$

$$= -\frac{bn\left(d+ex^2\right)^{3/2}}{25d^2x^5} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{5dx^5} + \frac{4e\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{15d^2x^3} - \frac{8e^2\sqrt{d+}}{}$$

$$= -\frac{bn\left(d+ex^2\right)^{3/2}}{25d^2x^5} + \frac{26ben\left(d+ex^2\right)^{3/2}}{225d^3x^3} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{5dx^5} + \frac{4e\sqrt{d+ex^2}\left(a+b\right.}{15d^2x^3}$$

$$= -\frac{8be^2n\sqrt{d+ex^2}}{15d^3x} - \frac{bn\left(d+ex^2\right)^{3/2}}{25d^2x^5} + \frac{26ben\left(d+ex^2\right)^{3/2}}{225d^3x^3} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{5dx^5} +$$

$$= -\frac{8be^2n\sqrt{d+ex^2}}{15d^3x} - \frac{bn\left(d+ex^2\right)^{3/2}}{25d^2x^5} + \frac{26ben\left(d+ex^2\right)^{3/2}}{225d^3x^3} - \frac{\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{5dx^5} +$$

$$= -\frac{8be^2n\sqrt{d+ex^2}}{15d^3x} - \frac{bn\left(d+ex^2\right)^{3/2}}{25d^2x^5} + \frac{26ben\left(d+ex^2\right)^{3/2}}{225d^3x^3} + \frac{8be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{15d^3} - \sqrt{}$$

Mathematica [A] time = 0.23, size = 147, normalized size = 0.72

$$-\frac{\sqrt{d+ex^2}\left(15a\left(3d^2-4dex^2+8e^2x^4\right)+bn\left(9d^2-17dex^2+94e^2x^4\right)\right)+15b\sqrt{d+ex^2}\left(3d^2-4dex^2+8e^2x^4\right)\log}{225d^3x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^6*Sqrt[d + e*x^2]),x]
```

```
[Out] -1/225*(Sqrt[d + e*x^2]*(15*a*(3*d^2 - 4*d*e*x^2 + 8*e^2*x^4) + b*n*(9*d^2
- 17*d*e*x^2 + 94*e^2*x^4)) + 15*b*Sqrt[d + e*x^2]*(3*d^2 - 4*d*e*x^2 + 8*e
^2*x^4)*Log[c*x^n] - 120*b*e^(5/2)*n*x^5*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]]
)/(d^3*x^5)
```

fricas [A] time = 0.49, size = 326, normalized size = 1.60

$$\left[\frac{60\,be^{\frac{5}{2}}nx^5\log\left(-2\,ex^2-2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)-\left(2\left(47\,be^2n+60\,ae^2\right)x^4+9\,bd^2n+45\,ad^2-(17\,bden+60\,ad\right.}{225\,d^3x^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^6/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/225*(60*b*e^(5/2)*n*x^5*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x - d)
- (2*(47*b*e^2*n + 60*a*e^2)*x^4 + 9*b*d^2*n + 45*a*d^2 - (17*b*d*e*n + 60*
a*d*e)*x^2 + 15*(8*b*e^2*x^4 - 4*b*d*e*x^2 + 3*b*d^2)*log(c) + 15*(8*b*e^2*
n*x^4 - 4*b*d*e*n*x^2 + 3*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^3*x^5), -1/2
25*(120*b*sqrt(-e)*e^2*n*x^5*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (2*(47*b*
e^2*n + 60*a*e^2)*x^4 + 9*b*d^2*n + 45*a*d^2 - (17*b*d*e*n + 60*a*d*e)*x^2
+ 15*(8*b*e^2*x^4 - 4*b*d*e*x^2 + 3*b*d^2)*log(c) + 15*(8*b*e^2*n*x^4 - 4*b
*d*e*n*x^2 + 3*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^3*x^5)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\sqrt{ex^2+d}\,x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^6/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^2 + d)*x^6), x)
```

maple [F] time = 0.40, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right)+a}{\sqrt{e\,x^2+d}\;x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^6/(e*x^2+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^6/(e*x^2+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{15}\,a\left(\frac{8\,\sqrt{ex^2+d}\,e^2}{d^3x}-\frac{4\,\sqrt{ex^2+d}\,e}{d^2x^3}+\frac{3\,\sqrt{ex^2+d}}{dx^5}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{\sqrt{ex^2+d}\,x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^6/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/15*a*(8*sqrt(e*x^2 + d)*e^2/(d^3*x) - 4*sqrt(e*x^2 + d)*e/(d^2*x^3) + 3*
sqrt(e*x^2 + d)/(d*x^5)) + b*integrate((log(c) + log(x^n))/(sqrt(e*x^2 + d)
*x^6), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^6\,\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^6*(d + e*x^2)^(1/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^6*(d + e*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\log\left(cx^n\right)}{x^6\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**6/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**6*sqrt(d + e*x**2)), x)
```

3.286 $\int \frac{x^7 (a+b\log(cx^n))}{(d+ex^2)^{3/2}} dx$

Optimal. Leaf size=209

$$\frac{d^3 \left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}+\frac{3d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log(c\right.}{5e^4}$$

```
[Out] 4/15*b*d*n*(e*x^2+d)^(3/2)/e^4-1/25*b*n*(e*x^2+d)^(5/2)/e^4+16/5*b*d^(5/2)*
n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/e^4-d*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/e^
4+1/5*(e*x^2+d)^(5/2)*(a+b*ln(c*x^n))/e^4+d^3*(a+b*ln(c*x^n))/e^4/(e*x^2+d)
^(1/2)-11/5*b*d^2*n*(e*x^2+d)^(1/2)/e^4+3*d^2*(a+b*ln(c*x^n))*(e*x^2+d)^(1/
2)/e^4
```

Rubi [A] time = 0.30, antiderivative size = 209, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {266, 43, 2350, 12, 1799, 1620, 63, 208}

$$\frac{d^3 \left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}+\frac{3d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log(c\right.}{5e^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^7*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (-11*b*d^2*n*Sqrt[d + e*x^2])/(5*e^4) + (4*b*d*n*(d + e*x^2)^(3/2))/(15*e^4
) - (b*n*(d + e*x^2)^(5/2))/(25*e^4) + (16*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x
^2]/Sqrt[d]])/(5*e^4) + (d^3*(a + b*Log[c*x^n]))/(e^4*Sqrt[d + e*x^2]) + (3
*d^2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^4 - (d*(d + e*x^2)^(3/2)*(a + b*
Log[c*x^n]))/e^4 + ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^7 \left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{3/2}}\,dx = \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}+\frac{3d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right.\right.}{e^4}$$

$$=\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}+\frac{3d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right.\right.}{e^4}$$

$$=\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}+\frac{3d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right.\right.}{e^4}$$

$$=\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}+\frac{3d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right.\right.}{e^4}$$

$$=-\frac{11bd^2n\sqrt{d+ex^2}}{5e^4}+\frac{4bdn\left(d+ex^2\right)^{3/2}}{15e^4}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e^4}+\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}+3d$$

$$=-\frac{11bd^2n\sqrt{d+ex^2}}{5e^4}+\frac{4bdn\left(d+ex^2\right)^{3/2}}{15e^4}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e^4}+\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}+3d$$

$$=-\frac{11bd^2n\sqrt{d+ex^2}}{5e^4}+\frac{4bdn\left(d+ex^2\right)^{3/2}}{15e^4}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e^4}+\frac{16bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right.}{5e^4}$$

Mathematica [A] time = 0.22, size = 195, normalized size = 0.93

$$\frac{240ad^3+120ad^2ex^2-30ade^2x^4+15ae^3x^6+15b\left(16d^3+8d^2ex^2-2de^2x^4+e^3x^6\right)\log\left(cx^n\right)-240bd^{5/2}n\log(x)\sqrt{}}{75e^4\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^7*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (240*a*d^3 - 148*b*d^3*n + 120*a*d^2*e*x^2 - 134*b*d^2*e*n*x^2 - 30*a*d*e^2
*x^4 + 11*b*d*e^2*n*x^4 + 15*a*e^3*x^6 - 3*b*e^3*n*x^6 - 240*b*d^(5/2)*n*Sq
rt[d + e*x^2]*Log[x] + 15*b*(16*d^3 + 8*d^2*e*x^2 - 2*d*e^2*x^4 + e^3*x^6)*
Log[c*x^n] + 240*b*d^(5/2)*n*Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[d + e*x^2
]])/(75*e^4*Sqrt[d + e*x^2])
```

fricas [A] time = 0.56, size = 461, normalized size = 2.21

$$\left[\frac{120\left(bd^2enx^2 + bd^3n\right)\sqrt{d}\,\log\left(-\frac{ex^2+2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right) - \left(3\left(be^3n - 5\,ae^3\right)x^6 + 148\,bd^3n - \left(11\,bde^2n - 30\,ade^2\right)x^4 \cdots}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/75*(120*(b*d^2*e*n*x^2 + b*d^3*n)*sqrt(d)*log(-(e*x^2 + 2*sqrt(e*x^2 + d
)*sqrt(d) + 2*d)/x^2) - (3*(b*e^3*n - 5*a*e^3)*x^6 + 148*b*d^3*n - (11*b*d*
e^2*n - 30*a*d*e^2)*x^4 - 240*a*d^3 + 2*(67*b*d^2*e*n - 60*a*d^2*e)*x^2 - 1
5*(b*e^3*x^6 - 2*b*d*e^2*x^4 + 8*b*d^2*e*x^2 + 16*b*d^3)*log(c) - 15*(b*e^3
*n*x^6 - 2*b*d*e^2*n*x^4 + 8*b*d^2*e*n*x^2 + 16*b*d^3*n)*log(x))*sqrt(e*x^2
 + d))/(e^5*x^2 + d*e^4), -1/75*(240*(b*d^2*e*n*x^2 + b*d^3*n)*sqrt(-d)*arc
tan(sqrt(-d)/sqrt(e*x^2 + d)) + (3*(b*e^3*n - 5*a*e^3)*x^6 + 148*b*d^3*n -
(11*b*d*e^2*n - 30*a*d*e^2)*x^4 - 240*a*d^3 + 2*(67*b*d^2*e*n - 60*a*d^2*e)
*x^2 - 15*(b*e^3*x^6 - 2*b*d*e^2*x^4 + 8*b*d^2*e*x^2 + 16*b*d^3)*log(c) - 1
5*(b*e^3*n*x^6 - 2*b*d*e^2*n*x^4 + 8*b*d^2*e*n*x^2 + 16*b*d^3*n)*log(x))*sq
rt(e*x^2 + d))/(e^5*x^2 + d*e^4)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right) + a\right)x^7}{\left(ex^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^7/(e*x^2 + d)^(3/2), x)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right) + a\right)x^7}{\left(e\,x^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7*(b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x^7*(b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

maxima [A] time = 1.47, size = 244, normalized size = 1.17

$$-\frac{1}{75}\,bn\left(\frac{120\,d^{\frac{5}{2}}\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{e^4} + \frac{3\left(ex^2+d\right)^{\frac{5}{2}} - 20\left(ex^2+d\right)^{\frac{3}{2}}d + 165\,\sqrt{ex^2+d}\,d^2}{e^4}\right) + \frac{1}{5}\left(\frac{x^6}{\sqrt{ex^2+d}\,e} - \frac{2\,\cdots}{\sqrt{ex^2 \cdots}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/75*b*n*(120*d^(5/2)*log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + s
qrt(d)))/e^4 + (3*(e*x^2 + d)^(5/2) - 20*(e*x^2 + d)^(3/2)*d + 165*sqrt(e*x
^2 + d)*d^2)/e^4) + 1/5*(x^6/(sqrt(e*x^2 + d)*e) - 2*d*x^4/(sqrt(e*x^2 + d)
*e^2) + 8*d^2*x^2/(sqrt(e*x^2 + d)*e^3) + 16*d^3/(sqrt(e*x^2 + d)*e^4))*b*l
og(c*x^n) + 1/5*(x^6/(sqrt(e*x^2 + d)*e) - 2*d*x^4/(sqrt(e*x^2 + d)*e^2) +
8*d^2*x^2/(sqrt(e*x^2 + d)*e^3) + 16*d^3/(sqrt(e*x^2 + d)*e^4))*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^7\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(e\,x^2+d\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^7*(a + b*log(c*x^n)))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((x^7*(a + b*log(c*x^n)))/(d + e*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**7*(a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

3.287 $\int \frac{x^5(a+b\log(cx^n))}{(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=158

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}-\frac{2d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}-\frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^3}$$

```
[Out] -1/9*b*n*(e*x^2+d)^(3/2)/e^3-8/3*b*d^(3/2)*n*arctanh((e*x^2+d)^(1/2)/d^(1/2
))/e^3+1/3*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/e^3-d^2*(a+b*ln(c*x^n))/e^3/(e*x
^2+d)^(1/2)+5/3*b*d*n*(e*x^2+d)^(1/2)/e^3-2*d*(a+b*ln(c*x^n))*(e*x^2+d)^(1/
2)/e^3
```

Rubi [A] time = 0.22, antiderivative size = 158, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {266, 43, 2350, 12, 1251, 897, 1153, 208}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}-\frac{2d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}-\frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (5*b*d*n*Sqrt[d + e*x^2])/(3*e^3) - (b*n*(d + e*x^2)^(3/2))/(9*e^3) - (8*b*
d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e^3) - (d^2*(a + b*Log[c*x^n
]))/(e^3*Sqrt[d + e*x^2]) - (2*d*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^3 +
((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
```

```
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^5\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{3/2}}\,dx = -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}-\frac{2d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}-\frac{2d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}-\frac{2d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}-\frac{2d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}-\frac{2d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}$$

$$= \frac{5bdn\sqrt{d+ex^2}}{3e^3}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}-\frac{2d\sqrt{d+ex^2}\left(a+b\log\left(cx\right.\right.}{e^3}$$

$$= \frac{5bdn\sqrt{d+ex^2}}{3e^3}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e^3}-\frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}-$$

Mathematica [A] time = 0.19, size = 160, normalized size = 1.01

$$\frac{-24ad^2-12adex^2+3ae^2x^4-3b\left(8d^2+4dex^2-e^2x^4\right)\log\left(cx^n\right)+24bd^{3/2}n\log(x)\sqrt{d+ex^2}-24bd^{3/2}n\sqrt{d+e}}{9e^3\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (-24*a*d^2 + 14*b*d^2*n - 12*a*d*e*x^2 + 13*b*d*e*n*x^2 + 3*a*e^2*x^4 - b*e
^2*n*x^4 + 24*b*d^(3/2)*n*Sqrt[d + e*x^2]*Log[x] - 3*b*(8*d^2 + 4*d*e*x^2 -
 e^2*x^4)*Log[c*x^n] - 24*b*d^(3/2)*n*Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[
d + e*x^2]])/(9*e^3*Sqrt[d + e*x^2])
```

fricas [A] time = 0.52, size = 356, normalized size = 2.25

$$\left[\frac{12\left(bdenx^2+bd^2n\right)\sqrt{d}\log\left(-\frac{ex^2-2\sqrt{ex^2+d}\sqrt{d}+2d}{x^2}\right)-\left(\left(be^2n-3ae^2\right)x^4-14bd^2n+24ad^2-(13bden-12ade)\right.}{9\left(e^4x^2+de^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/9*(12*(b*d*e*n*x^2 + b*d^2*n)*sqrt(d)*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sq
rt(d) + 2*d)/x^2) - ((b*e^2*n - 3*a*e^2)*x^4 - 14*b*d^2*n + 24*a*d^2 - (13*
b*d*e*n - 12*a*d*e)*x^2 - 3*(b*e^2*x^4 - 4*b*d*e*x^2 - 8*b*d^2)*log(c) - 3*
(b*e^2*n*x^4 - 4*b*d*e*n*x^2 - 8*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(e^4*x^2
 + d*e^3), 1/9*(24*(b*d*e*n*x^2 + b*d^2*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*
x^2 + d)) - ((b*e^2*n - 3*a*e^2)*x^4 - 14*b*d^2*n + 24*a*d^2 - (13*b*d*e*n
- 12*a*d*e)*x^2 - 3*(b*e^2*x^4 - 4*b*d*e*x^2 - 8*b*d^2)*log(c) - 3*(b*e^2*n
*x^4 - 4*b*d*e*n*x^2 - 8*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(e^4*x^2 + d*e^3
)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x^5}{\left(ex^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x^2 + d)^(3/2), x)
```

maple [F] time = 0.35, size = 0, normalized size = 0.00

$$\int\frac{\left(b\ln\left(c\,x^n\right)+a\right)x^5}{\left(e\,x^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x^5*(b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

maxima [A] time = 1.49, size = 189, normalized size = 1.20

$$\frac{1}{9}\,bn\left(\frac{12\,d^{\frac{3}{2}}\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{e^3}-\frac{\left(ex^2+d\right)^{\frac{3}{2}}-15\,\sqrt{ex^2+d}\,d}{e^3}\right)+\frac{1}{3}\left(\frac{x^4}{\sqrt{ex^2+d}\,e}-\frac{4\,dx^2}{\sqrt{ex^2+d}\,e^2}-\frac{8\,d^2}{\sqrt{ex^2+d}\,e^3}\right)b\log\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/9*b*n*(12*d^(3/2)*log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + sqrt
(d)))/e^3 - ((e*x^2 + d)^(3/2) - 15*sqrt(e*x^2 + d)*d)/e^3) + 1/3*(x^4/(sqr
t(e*x^2 + d)*e) - 4*d*x^2/(sqrt(e*x^2 + d)*e^2) - 8*d^2/(sqrt(e*x^2 + d)*e^
3))*b*log(c*x^n) + 1/3*(x^4/(sqrt(e*x^2 + d)*e) - 4*d*x^2/(sqrt(e*x^2 + d)*
e^2) - 8*d^2/(sqrt(e*x^2 + d)*e^3))*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^5\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\left(e\,x^2+d\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

3.288 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=100

$$\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{e^2}+\frac{2b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e^2}$$

```
[Out] 2*b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))*d^(1/2)/e^2+d*(a+b*ln(c*x^n))/e^2/(e
*x^2+d)^(1/2)-b*n*(e*x^2+d)^(1/2)/e^2+(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/e^2
```

Rubi [A] time = 0.16, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {266, 43, 2350, 12, 446, 80, 63, 208}

$$\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{e^2}+\frac{2b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] -((b*n*Sqrt[d + e*x^2])/e^2) + (2*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[
d]])/e^2 + (d*(a + b*Log[c*x^n]))/(e^2*Sqrt[d + e*x^2]) + (Sqrt[d + e*x^2]*
(a + b*Log[c*x^n]))/e^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^3 \left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{3/2}}\,dx = \frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{e^2}-(bn)\int\frac{2d+ex^2}{e^2x\sqrt{d+ex^2}}\,dx$$

$$=\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{(bn)\int\frac{2d+ex^2}{x\sqrt{d+ex^2}}\,dx}{e^2}$$

$$=\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{(bn)\,\text{Subst}\left(\int\frac{2d+ex}{x\sqrt{d+ex}}\,dx,x,x^2\right)}{2e^2}$$

$$=-\frac{bn\sqrt{d+ex^2}}{e^2}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{(bdn)\,\text{Subst}\left(\int \ldots\right.}{e\ldots}$$

$$=-\frac{bn\sqrt{d+ex^2}}{e^2}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{(2bdn)\,\text{Subst}\left(\int \ldots\right.}{\ldots}$$

$$=-\frac{bn\sqrt{d+ex^2}}{e^2}+\frac{2b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e^2}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,\left(a+b\,\text{lo}\ldots\right.}{e^2}$$

Mathematica [A] time = 0.15, size = 118, normalized size = 1.18

$$\frac{2ad+aex^2+b\left(2d+ex^2\right)\log\left(cx^n\right)-2b\sqrt{d}\,n\log(x)\sqrt{d+ex^2}+2b\sqrt{d}\,n\sqrt{d+ex^2}\,\log\left(\sqrt{d}\,\sqrt{d+ex^2}+d\right)-bdn-\ldots}{e^2\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (2*a*d - b*d*n + a*e*x^2 - b*e*n*x^2 - 2*b*Sqrt[d]*n*Sqrt[d + e*x^2]*Log[x]
 + b*(2*d + e*x^2)*Log[c*x^n] + 2*b*Sqrt[d]*n*Sqrt[d + e*x^2]*Log[d + Sqrt[
d]*Sqrt[d + e*x^2]])/(e^2*Sqrt[d + e*x^2])
```

fricas [A] time = 0.46, size = 245, normalized size = 2.45

$$\left[\frac{\left(benx^2 + bdn\right)\sqrt{d}\,\log\left(-\frac{ex^2+2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right) - \left(bdn + (ben - ae)x^2 - 2\,ad - \left(bex^2 + 2\,bd\right)\log(c) - \left(benx^2 + 2\right.\right.}{e^3x^2 + de^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [((b*e*n*x^2 + b*d*n)*sqrt(d)*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d
)/x^2) - (b*d*n + (b*e*n - a*e)*x^2 - 2*a*d - (b*e*x^2 + 2*b*d)*log(c) - (b
*e*n*x^2 + 2*b*d*n)*log(x))*sqrt(e*x^2 + d))/(e^3*x^2 + d*e^2), -(2*(b*e*n*
x^2 + b*d*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (b*d*n + (b*e*n -
a*e)*x^2 - 2*a*d - (b*e*x^2 + 2*b*d)*log(c) - (b*e*n*x^2 + 2*b*d*n)*log(x))
*sqrt(e*x^2 + d))/(e^3*x^2 + d*e^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right) + a\right)x^3}{\left(ex^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^2 + d)^(3/2), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right) + a\right)x^3}{\left(e\,x^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x^3*(b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

maxima [A] time = 1.68, size = 132, normalized size = 1.32

$$-bn\left(\frac{\sqrt{d}\,\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{e^2} + \frac{\sqrt{ex^2+d}}{e^2}\right) + b\left(\frac{x^2}{\sqrt{ex^2+d}\,e} + \frac{2\,d}{\sqrt{ex^2+d}\,e^2}\right)\log\left(cx^n\right) + a\left(\frac{x^2}{\sqrt{ex^2+d}\,e} + \frac{2\,d}{\sqrt{ex^2+d}\,e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -b*n*(sqrt(d)*log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + sqrt(d)))/
e^2 + sqrt(e*x^2 + d)/e^2) + b*(x^2/(sqrt(e*x^2 + d)*e) + 2*d/(sqrt(e*x^2 +
 d)*e^2))*log(c*x^n) + a*(x^2/(sqrt(e*x^2 + d)*e) + 2*d/(sqrt(e*x^2 + d)*e^
2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(e\,x^2+d\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((x^3*(a + b*log(c*x^n)))/(d + e*x^2)^(3/2), x)
```

sympy [A] time = 47.87, size = 163, normalized size = 1.63

$$a\left(\begin{cases} \frac{x^4}{4d^{\frac{3}{2}}} & \text{for } e=0 \\ \frac{d}{e^2\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}}{e^2} & \text{otherwise} \end{cases}\right) - bn\left(\begin{cases} \frac{x^4}{16d^{\frac{3}{2}}} & \text{for } e=0 \\ -\frac{2\sqrt{d}\operatorname{asinh}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)}{e^2} + \frac{d}{e^{\frac{5}{2}}x\sqrt{\frac{d}{ex^2}+1}} + \frac{x}{e^{\frac{3}{2}}\sqrt{\frac{d}{ex^2}+1}} & \text{otherwise} \end{cases}\right) + b\left(\begin{cases} \frac{x^4}{4d^{\frac{3}{2}}} \\ \frac{d}{e^2\sqrt{d+ex^2}} \end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
```

```
[Out] a*Piecewise((x**4/(4*d**(3/2)), Eq(e, 0)), (d/(e**2*sqrt(d + e*x**2)) + sqr
t(d + e*x**2)/e**2, True)) - b*n*Piecewise((x**4/(16*d**(3/2)), Eq(e, 0)),
(-2*sqrt(d)*asinh(sqrt(d)/(sqrt(e)*x))/e**2 + d/(e**(5/2)*x*sqrt(d/(e*x**2)
 + 1)) + x/(e**(3/2)*sqrt(d/(e*x**2) + 1)), True)) + b*Piecewise((x**4/(4*d
**(3/2)), Eq(e, 0)), (d/(e**2*sqrt(d + e*x**2)) + sqrt(d + e*x**2)/e**2, Tr
ue))*log(c*x**n)
```

3.289 $\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=57

$$-\frac{a+b\log\left(cx^n\right)}{e\sqrt{d+ex^2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}\,e}$$

```
[Out] -b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/e/d^(1/2)+(-a-b*ln(c*x^n))/e/(e*x^2+d
)^(1/2)
```

Rubi [A] time = 0.08, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2338, 266, 63, 208}

$$-\frac{a+b\log\left(cx^n\right)}{e\sqrt{d+ex^2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}\,e}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] -((b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(Sqrt[d]*e)) - (a + b*Log[c*x^n])/
(e*Sqrt[d + e*x^2])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{3/2}}\,dx = -\frac{a+b\log\left(cx^n\right)}{e\sqrt{d+ex^2}} + \frac{(bn)\int \frac{1}{x\sqrt{d+ex^2}}\,dx}{e}$$

$$= -\frac{a+b\log\left(cx^n\right)}{e\sqrt{d+ex^2}} + \frac{(bn)\,\text{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx, x, x^2\right)}{2e}$$

$$= -\frac{a+b\log\left(cx^n\right)}{e\sqrt{d+ex^2}} + \frac{(bn)\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx, x, \sqrt{d+ex^2}\right)}{e^2}$$

$$= -\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}\,e} - \frac{a+b\log\left(cx^n\right)}{e\sqrt{d+ex^2}}$$

Mathematica [A] time = 0.14, size = 77, normalized size = 1.35

$$-\frac{\frac{a}{\sqrt{d+ex^2}} + \frac{b\log(cx^n)}{\sqrt{d+ex^2}} + \frac{bn\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)}{\sqrt{d}} - \frac{bn\log(x)}{\sqrt{d}}}{e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] -((a/Sqrt[d + e*x^2] - (b*n*Log[x])/Sqrt[d] + (b*Log[c*x^n])/Sqrt[d + e*x^2
] + (b*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/Sqrt[d])/e)
```

fricas [A] time = 0.46, size = 169, normalized size = 2.96

$$\left[\frac{\left(benx^2+bdn\right)\sqrt{d}\,\log\left(-\frac{ex^2-2\sqrt{ex^2+d}\sqrt{d}+2d}{x^2}\right) - 2\left(bdn\log(x)+bd\log(c)+ad\right)\sqrt{ex^2+d}}{2\left(de^2x^2+d^2e\right)}, \frac{\left(benx^2+bdn\right)\sqrt{-d}\ \text{arc}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/2*((b*e*n*x^2 + b*d*n)*sqrt(d)*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) +
 2*d)/x^2) - 2*(b*d*n*log(x) + b*d*log(c) + a*d)*sqrt(e*x^2 + d))/(d*e^2*x^
2 + d^2*e), ((b*e*n*x^2 + b*d*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d))
- (b*d*n*log(x) + b*d*log(c) + a*d)*sqrt(e*x^2 + d))/(d*e^2*x^2 + d^2*e)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x}{\left(ex^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^2 + d)^(3/2), x)
```

maple [F] time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)x}{\left(e\,x^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x*(b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

maxima [A] time = 0.60, size = 59, normalized size = 1.04

$$-\frac{bn\,\mathrm{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{\sqrt{d}\,e}-\frac{b\log\left(cx^n\right)}{\sqrt{ex^2+d}\,e}-\frac{a}{\sqrt{ex^2+d}\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -b*n*arcsinh(d/(sqrt(d*e)*abs(x)))/(sqrt(d)*e) - b*log(c*x^n)/(sqrt(e*x^2 +
 d)*e) - a/(sqrt(e*x^2 + d)*e)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(e\,x^2+d\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((x*(a + b*log(c*x^n)))/(d + e*x^2)^(3/2), x)
```

sympy [A] time = 12.77, size = 80, normalized size = 1.40

$$-\frac{a}{e\sqrt{d+ex^2}}-bn\left(\begin{cases}\frac{x^2}{4d^{\frac{3}{2}}} & \text{for}\ e=0\\ \frac{\operatorname{asinh}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)}{\sqrt{d}e} & \text{otherwise}\end{cases}\right)+b\left(\begin{cases}\frac{x^2}{2d^{\frac{3}{2}}} & \text{for}\ e=0\\ -\frac{1}{e\sqrt{d+ex^2}} & \text{otherwise}\end{cases}\right)\log\left(cx^n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
```

```
[Out] -a/(e*sqrt(d + e*x**2)) - b*n*Piecewise((x**2/(4*d**(3/2)), Eq(e, 0)), (asi
nh(sqrt(d)/(sqrt(e)*x))/(sqrt(d)*e), True)) + b*Piecewise((x**2/(2*d**(3/2)
), Eq(e, 0)), (-1/(e*sqrt(d + e*x**2)), True))*log(c*x**n)
```

3.290 $\int \frac{a+b\log(cx^n)}{x\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=209

$$\left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bn\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^2+d}}\right)}{2d^{3/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{\ldots}}{}\right.}{d^{3/2}}$$

```
[Out] b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(3/2)+1/2*b*n*arctanh((e*x^2+d)^(1/2
)/d^(1/2))^2/d^(3/2)-b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(
1/2)-(e*x^2+d)^(1/2)))/d^(3/2)-1/2*b*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(e*x^
2+d)^(1/2)))/d^(3/2)+(a+b*ln(c*x^n))*(-arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(
3/2)+1/d/(e*x^2+d)^(1/2))
```

Rubi [A] time = 0.33, antiderivative size = 209, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 51, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{2d^{3/2}}+\left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}}+\frac{bn\,\mathrm{t}\ldots}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^2)^(3/2)),x]
```

```
[Out] (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/d^(3/2) + (b*n*ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]]^2)/(2*d^(3/2)) + (1/(d*Sqrt[d + e*x^2]) - ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]]/d^(3/2))*(a + b*Log[c*x^n]) - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt
[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/d^(3/2) - (b*n*PolyLog[2
, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(3/2))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\left(d+ex^2\right)^{3/2}}\,dx = \left(\frac{1}{d\sqrt{d+ex^2}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)\left(a+b\log(cx^n)\right) - (bn)\int\left(\frac{1}{dx\sqrt{d+ex^2}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+}}{\sqrt{}}\right.}{d^{3/2}x}\right.$$

$$= \left(\frac{1}{d\sqrt{d+ex^2}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)\left(a+b\log(cx^n)\right) + \frac{(bn)\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{x}dx}{d^{3/2}} - \frac{(bn)\int\frac{}{x\sqrt{}}}{d}$$

$$= \left(\frac{1}{d\sqrt{d+ex^2}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)\left(a+b\log(cx^n)\right) + \frac{(bn)\,\mathrm{Subst}\left(\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}dx, x, x^2\right.}{2d^{3/2}}$$

$$= \left(\frac{1}{d\sqrt{d+ex^2}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)\left(a+b\log(cx^n)\right) + \frac{(bn)\,\mathrm{Subst}\left(\int\frac{x\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{-d+x^2}dx, x, \sqrt{d}\right.}{d^{3/2}}$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}} + \left(\frac{1}{d\sqrt{d+ex^2}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)\left(a+b\log\right.$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}} + \left(\frac{1}{d\sqrt{d+ex^2}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)\left(a+b\log\right.$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}} + \left(\frac{1}{d\sqrt{d+ex^2}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)\left(a+b\log\right.$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}} + \left(\frac{1}{d\sqrt{d+ex^2}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)\left(a+b\log\right.$$

Mathematica [C] time = 0.39, size = 241, normalized size = 1.15

$$\frac{9ex^2\left(\log(x)\sqrt{d+ex^2}\left(a+b\log(cx^n)+bn\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)\right)+\left(\sqrt{d}-\sqrt{d+ex^2}\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)\right)\right.}{9d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^2)^(3/2)),x]
```

```
[Out] (-(b*d^(3/2)*n*Sqrt[1 + d/(e*x^2)]*HypergeometricPFQ[{3/2, 3/2, 3/2}, {5/2,
 5/2}, -(d/(e*x^2))]) + 9*e*x^2*(-(b*Sqrt[e]*n*Sqrt[1 + d/(e*x^2)]*x*ArcSin
```

```
h[Sqrt[d]/(Sqrt[e]*x)]*Log[x]) - b*n*Sqrt[d + e*x^2]*Log[x]^2 + Sqrt[d + e*
x^2]*Log[x]*(a + b*Log[c*x^n] + b*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]]) + (a
+ b*Log[c*x^n])*(Sqrt[d] - Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[d + e*x^2]]
)))/(9*d^(3/2)*e*x^2*Sqrt[d + e*x^2])
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,b\log\left(cx^n\right)+\sqrt{ex^2+d}\,a}{e^2x^5+2\,dex^3+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e^2*x^5 + 2*d*
e*x^3 + d^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(3/2)*x), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right)+a}{\left(e\,x^2+d\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^2+d)^(3/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x/(e*x^2+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a\left(\frac{\operatorname{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{d^{\frac{3}{2}}}-\frac{1}{\sqrt{ex^2+d}\,d}\right)+b\int \frac{\log(c)+\log\left(x^n\right)}{\left(ex^3+dx\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -a*(arcsinh(d/(sqrt(d*e)*abs(x)))/d^(3/2) - 1/(sqrt(e*x^2 + d)*d)) + b*inte
grate((log(c) + log(x^n))/((e*x^3 + d*x)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x\,{\left(e\,x^2+d\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^2)^(3/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\log\left(cx^{n}\right)}{x\left(d + ex^{2}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x**2+d)**(3/2),x)
[Out] Integral((a + b*log(c*x**n))/(x*(d + e*x**2)**(3/2)), x)
```

3.291 $\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=287

$$\frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^{5/2}}-\frac{3e\left(a+b\log\left(cx^n\right)\right)}{2d^2\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{2dx^2\sqrt{d+ex^2}}+\frac{3ben\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^2+d}}\right)}{4d^{5/2}}-\frac{3ben\,\text{ta}}{}$$

```
[Out] -5/4*b*e*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(5/2)-3/4*b*e*n*arctanh((e*x^
2+d)^(1/2)/d^(1/2))^2/d^(5/2)+3/2*e*arctanh((e*x^2+d)^(1/2)/d^(1/2))*(a+b*l
n(c*x^n))/d^(5/2)+3/2*b*e*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(
d^(1/2)-(e*x^2+d)^(1/2)))/d^(5/2)+3/4*b*e*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-
(e*x^2+d)^(1/2)))/d^(5/2)-3/2*e*(a+b*ln(c*x^n))/d^2/(e*x^2+d)^(1/2)+1/2*(-a
-b*ln(c*x^n))/d/x^2/(e*x^2+d)^(1/2)-1/4*b*n*(e*x^2+d)^(1/2)/d^2/x^2
```

Rubi [A] time = 0.39, antiderivative size = 286, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {266, 51, 63, 208, 2350, 446, 78, 5984, 5918, 2402, 2315}

$$\frac{3ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4d^{5/2}}-\frac{3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2}+\frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^{5/2}}+\frac{a+b\,\text{l}}{dx^2\sqrt{}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^(3/2)),x]
```

```
[Out] -(b*n*Sqrt[d + e*x^2])/(4*d^2*x^2) - (5*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[
d]])/(4*d^(5/2)) - (3*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(4*d^(5/2))
 + (a + b*Log[c*x^n])/(d*x^2*Sqrt[d + e*x^2]) - (3*Sqrt[d + e*x^2]*(a + b*L
og[c*x^n]))/(2*d^2*x^2) + (3*e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]*(a + b*Log[
c*x^n]))/(2*d^(5/2)) + (3*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]*Log[(2*Sqr
t[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(5/2)) + (3*b*e*n*PolyLog[2, 1 - (
2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*d^(5/2))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
```

```
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)^{3/2}}\,dx = \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^2x^2} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{2d^{5/2}}$$

$$= \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^2x^2} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{2d^{5/2}}$$

$$= \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^2x^2} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{2d^{5/2}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^2x^2} + \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^2x^2} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(\right.}{2d^{5/2}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^2x^2} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{5/2}} + \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\left(a+b\log(cx\right.}{2d^2x^2}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^2x^2} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{5/2}} + \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} -$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^2x^2} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{5/2}} + \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} -$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^2x^2} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{5/2}} + \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} -$$

Mathematica [C] time = 0.36, size = 218, normalized size = 0.76

$$\frac{3bd^{5/2}n\sqrt{\frac{d}{ex^2}+1}\;{}_3F_2\left(\frac{5}{2},\frac{5}{2},\frac{5}{2};\frac{7}{2},\frac{7}{2};-\frac{d}{ex^2}\right) - 25ex^2\left(\sqrt{d}\left(d+3ex^2\right)+3ex^2\log(x)\sqrt{d+ex^2} - 3ex^2\sqrt{d+ex^2}\log\left(\right.\right.}{50d^{5/2}ex^4\sqrt{d+}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^(3/2)),x]
```

```
[Out] (3*b*d^(5/2)*n*Sqrt[1 + d/(e*x^2)]*HypergeometricPFQ[{5/2, 5/2, 5/2}, {7/2,
 7/2}, -(d/(e*x^2))] - 5*b*d^(5/2)*n*Sqrt[1 + d/(e*x^2)]*Hypergeometric2F1[
3/2, 5/2, 7/2, -(d/(e*x^2))]*(1 + 2*Log[x]) - 25*e*x^2*(a - b*n*Log[x] + b*
Log[c*x^n])*(Sqrt[d]*(d + 3*e*x^2) + 3*e*x^2*Sqrt[d + e*x^2]*Log[x] - 3*e*x
^2*Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[d + e*x^2]]))/(50*d^(5/2)*e*x^4*Sqr
t[d + e*x^2])
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{\sqrt{ex^2+d}\,b\log(cx^n)+\sqrt{ex^2+d}\,a}{e^2x^7+2\,dex^5+d^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e^2*x^7 + 2*d*
e*x^5 + d^2*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b \log(cx^n) + a}{(ex^2 + d)^{\frac{3}{2}} x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(3/2)*x^3), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{b \ln(c x^n) + a}{(e x^2 + d)^{\frac{3}{2}} x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(e*x^2+d)^(3/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^3/(e*x^2+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2} a \left(\frac{3 e \operatorname{arsinh}\left(\frac{d}{\sqrt{de}|x|}\right)}{d^{\frac{5}{2}}} - \frac{3 e}{\sqrt{ex^2 + d}\, d^2} - \frac{1}{\sqrt{ex^2 + d}\, dx^2} \right) + b \int \frac{\log(c) + \log(x^n)}{(ex^5 + dx^3)\sqrt{ex^2 + d}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*a*(3*e*arcsinh(d/(sqrt(d*e)*abs(x)))/d^(5/2) - 3*e/(sqrt(e*x^2 + d)*d^2
) - 1/(sqrt(e*x^2 + d)*d*x^2)) + b*integrate((log(c) + log(x^n))/((e*x^5 +
d*x^3)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b \ln(c x^n)}{x^3 (e x^2 + d)^{3/2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)^(3/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \log(cx^n)}{x^3 (d + ex^2)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**3*(d + e*x**2)**(3/2)), x)
```

3.292 $\int \frac{x^2\left(a+b\log(cx^n)\right)}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=328

$$\frac{\sqrt{d}\,\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}\sqrt{d+ex^2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d+ex^2}}-\frac{b\sqrt{d}\,n\sqrt{\frac{ex^2}{d}+1}\,\mathrm{Li}_2\left(e^{2\sinh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}\right)}{2e^{3/2}\sqrt{d+ex^2}}+\frac{b\sqrt{d}\,n\sqrt{}}{}$$

```
[Out] -x*(a+b*ln(c*x^n))/e/(e*x^2+d)^(1/2)+b*n*arcsinh(x*e^(1/2)/d^(1/2))*d^(1/2)
*(1+e*x^2/d)^(1/2)/e^(3/2)/(e*x^2+d)^(1/2)+1/2*b*n*arcsinh(x*e^(1/2)/d^(1/2
))^2*d^(1/2)*(1+e*x^2/d)^(1/2)/e^(3/2)/(e*x^2+d)^(1/2)-b*n*arcsinh(x*e^(1/2
)/d^(1/2))*ln(1-(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*d^(1/2)*(1+e*x^2/d
)^(1/2)/e^(3/2)/(e*x^2+d)^(1/2)+arcsinh(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*
d^(1/2)*(1+e*x^2/d)^(1/2)/e^(3/2)/(e*x^2+d)^(1/2)-1/2*b*n*polylog(2,(x*e^(1
/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*d^(1/2)*(1+e*x^2/d)^(1/2)/e^(3/2)/(e*x^2+
d)^(1/2)
```

Rubi [A] time = 0.47, antiderivative size = 328, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {2341, 288, 215, 2350, 14, 21, 5659, 3716, 2190, 2279, 2391}

$$-\frac{b\sqrt{d}\,n\sqrt{\frac{ex^2}{d}+1}\,\mathrm{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}\right)}{2e^{3/2}\sqrt{d+ex^2}}+\frac{\sqrt{d}\,\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}\sqrt{d+ex^2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(e^(3/2)*Sqr
t[d + e*x^2]) + (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d
]]^2)/(2*e^(3/2)*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSin
h[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(e^(3/2
)*Sqrt[d + e*x^2]) - (x*(a + b*Log[c*x^n]))/(e*Sqrt[d + e*x^2]) + (Sqrt[d]*
Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(e^(3/
2)*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcS
inh[(Sqrt[e]*x)/Sqrt[d]])])/(2*e^(3/2)*Sqrt[d + e*x^2])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{3/2}}\,dx = \frac{\sqrt{1+\frac{ex^2}{d}}\int \frac{x^2\left(a+b\log(cx^n)\right)}{\left(1+\frac{ex^2}{d}\right)^{3/2}}\,dx}{d\sqrt{d+ex^2}}$$

$$= -\frac{x\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}\sqrt{d+ex^2}} - \frac{\left(bn\sqrt{1+\frac{ex}{d}}\right.}{}$$

$$= -\frac{x\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}\sqrt{d+ex^2}} - \frac{\left(bn\sqrt{1+\frac{ex}{d}}\right.}{}$$

$$= -\frac{x\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}\sqrt{d+ex^2}} - \frac{\left(b\sqrt{d}n\sqrt{1\right.}{e}$$

$$= -\frac{x\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{3/2}\sqrt{d+ex^2}} - \frac{\left(b\sqrt{d}n\sqrt{1\right.}{}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{e^{3/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{3/2}\sqrt{d+ex^2}} - \frac{x\left(a+b\log\left(cx\right.\right.}{e\sqrt{d+ex^2}}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{e^{3/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{3/2}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}}{}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{e^{3/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{3/2}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}}{}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{e^{3/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{3/2}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}}{}$$

<u>**Mathematica**</u> **[C]**   time = 0.48, size = 217, normalized size = 0.66

$$-\frac{bn\sqrt{\frac{ex^2}{d}+1}\left(e^{3/2}x^3\left(d+ex^2\right)\,{}_3F_2\left(\frac{3}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};-\frac{ex^2}{d}\right)-9d^{3/2}\log(x)\left(d+ex^2\right)\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)+9d^2\sqrt{e}x\log(x)\right.}{9de^{3/2}\left(d+ex^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] -1/9*(b*n*Sqrt[1 + (e*x^2)/d]*(e^(3/2)*x^3*(d + e*x^2)*HypergeometricPFQ[{3
/2, 3/2, 3/2}, {5/2, 5/2}, -((e*x^2)/d)] + 9*d^2*Sqrt[e]*x*Sqrt[1 + (e*x^2)
/d]*Log[x] - 9*d^(3/2)*(d + e*x^2)*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[x]))/(d
*e^(3/2)*(d + e*x^2)^(3/2)) - (x*(a - b*n*Log[x] + b*Log[c*x^n]))/(e*Sqrt[d
 + e*x^2]) + ((a - b*n*Log[x] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*
x^2]])/e^(3/2)
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{ex^2+d}\,bx^2\log\left(cx^n\right)+\sqrt{ex^2+d}\,ax^2}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*x^2*log(c*x^n) + sqrt(e*x^2 + d)*a*x^2)/(e^2*x^
4 + 2*d*e*x^2 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x^2}{\left(ex^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^2 + d)^(3/2), x)
```

maple [F] time = 0.32, size = 0, normalized size = 0.00

$$\int\frac{\left(b\ln\left(c\,x^n\right)+a\right)x^2}{\left(e\,x^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x^2*(b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a\left(\frac{x}{\sqrt{ex^2+d}\,e}-\frac{\mathrm{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{e^{\frac{3}{2}}}\right)+b\int\frac{x^2\log(c)+x^2\log\left(x^n\right)}{\left(ex^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -a*(x/(sqrt(e*x^2 + d)*e) - arcsinh(e*x/sqrt(d*e))/e^(3/2)) + b*integrate((
x^2*log(c) + x^2*log(x^n))/(e*x^2 + d)^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\left(e\,x^2+d\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2)^(3/2), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \left(a + b \log \left(cx^n\right)\right)}{\left(d + ex^2\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
[Out] Integral(x**2*(a + b*log(c*x**n))/(d + e*x**2)**(3/2), x)
```

3.293 $\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=58

$$\frac{x\left(a+b\log\left(cx^n\right)\right)}{d\sqrt{d+ex^2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{d\sqrt{e}}$$

```
[Out] -b*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/d/e^(1/2)+x*(a+b*ln(c*x^n))/d/(e*x^
2+d)^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {2314, 217, 206}

$$\frac{x\left(a+b\log\left(cx^n\right)\right)}{d\sqrt{d+ex^2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{d\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^2)^(3/2),x]
```

```
[Out] -((b*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(d*Sqrt[e])) + (x*(a + b*Log[c
*x^n]))/(d*Sqrt[d + e*x^2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log\left(cx^n\right)}{\left(d+ex^2\right)^{3/2}}\,dx &= \frac{x\left(a+b\log\left(cx^n\right)\right)}{d\sqrt{d+ex^2}}-\frac{(bn)\int \frac{1}{\sqrt{d+ex^2}}\,dx}{d}\\
&= \frac{x\left(a+b\log\left(cx^n\right)\right)}{d\sqrt{d+ex^2}}-\frac{(bn)\,\text{Subst}\left(\int \frac{1}{1-ex^2}\,dx,x,\frac{x}{\sqrt{d+ex^2}}\right)}{d}\\
&= -\frac{bn\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{d\sqrt{e}}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{d\sqrt{d+ex^2}}
\end{aligned}$$

Mathematica [A] time = 0.10, size = 70, normalized size = 1.21

$$\frac{\frac{ax}{\sqrt{d+ex^2}}+\frac{bx\log(cx^n)}{\sqrt{d+ex^2}}-\frac{bn\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{\sqrt{e}}}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^2)^(3/2),x]
```

```
[Out] ((a*x)/Sqrt[d + e*x^2] + (b*x*Log[c*x^n])/Sqrt[d + e*x^2] - (b*n*Log[e*x +
Sqrt[e]*Sqrt[d + e*x^2]])/Sqrt[e])/d
```

fricas [A] time = 0.44, size = 172, normalized size = 2.97

$$\left[\frac{\left(benx^2+bdn\right)\sqrt{e}\,\log\left(-2\,ex^2+2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)+2\left(benx\log(x)+bex\log(c)+aex\right)\sqrt{ex^2+d}}{2\left(de^2x^2+d^2e\right)},\frac{\left(benx^2\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/2*((b*e*n*x^2 + b*d*n)*sqrt(e)*log(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*
x - d) + 2*(b*e*n*x*log(x) + b*e*x*log(c) + a*e*x)*sqrt(e*x^2 + d))/(d*e^2*
x^2 + d^2*e), ((b*e*n*x^2 + b*d*n)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 +
d)) + (b*e*n*x*log(x) + b*e*x*log(c) + a*e*x)*sqrt(e*x^2 + d))/(d*e^2*x^2 +
 d^2*e)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^2 + d)^(3/2), x)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right)+a}{\left(e\,x^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/(e*x^2+d)^(3/2),x)
```

maxima [A] time = 0.65, size = 56, normalized size = 0.97

$$-\frac{bn\,\operatorname{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{d\sqrt{e}}+\frac{bx\log\left(cx^n\right)}{\sqrt{ex^2+d}\,d}+\frac{ax}{\sqrt{ex^2+d}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -b*n*arcsinh(e*x/sqrt(d*e))/(d*sqrt(e)) + b*x*log(c*x^n)/(sqrt(e*x^2 + d)*d
) + a*x/(sqrt(e*x^2 + d)*d)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a + b\ \ln\left(c\, x^n\right)}{\left(e\, x^2 + d\right)^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((a + b*log(c*x^n))/(d + e*x^2)^(3/2), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \log\left(cx^{n}\right)}{\left(d + ex^{2}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(d + e*x**2)**(3/2), x)
```

3.294 $\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=110

$$-\frac{2ex\left(a+b\log\left(cx^n\right)\right)}{d^2\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{dx\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{d^2x}+\frac{2b\sqrt{e}\,n\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{d^2}$$

```
[Out] 2*b*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))*e^(1/2)/d^2+(-a-b*ln(c*x^n))/d/x/(
e*x^2+d)^(1/2)-2*e*x*(a+b*ln(c*x^n))/d^2/(e*x^2+d)^(1/2)-b*n*(e*x^2+d)^(1/2
)/d^2/x
```

Rubi [A] time = 0.13, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {271, 191, 2350, 12, 451, 217, 206}

$$-\frac{2ex\left(a+b\log\left(cx^n\right)\right)}{d^2\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{dx\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{d^2x}+\frac{2b\sqrt{e}\,n\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^(3/2)),x]
```

```
[Out] -((b*n*Sqrt[d + e*x^2])/(d^2*x)) + (2*b*Sqrt[e]*n*ArcTanh[(Sqrt[e]*x)/Sqrt[
d + e*x^2]])/d^2 - (a + b*Log[c*x^n])/(d*x*Sqrt[d + e*x^2]) - (2*e*x*(a + b
*Log[c*x^n]))/(d^2*Sqrt[d + e*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
```

```
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+b\log(cx^n)}{x^2\left(d+ex^2\right)^{3/2}}\,dx &= -\frac{a+b\log(cx^n)}{dx\sqrt{d+ex^2}}-\frac{2ex\left(a+b\log(cx^n)\right)}{d^2\sqrt{d+ex^2}}-(bn)\int\frac{-d-2ex^2}{d^2x^2\sqrt{d+ex^2}}\,dx\\
&= -\frac{a+b\log(cx^n)}{dx\sqrt{d+ex^2}}-\frac{2ex\left(a+b\log(cx^n)\right)}{d^2\sqrt{d+ex^2}}-\frac{(bn)\int\frac{-d-2ex^2}{x^2\sqrt{d+ex^2}}\,dx}{d^2}\\
&= -\frac{bn\sqrt{d+ex^2}}{d^2x}-\frac{a+b\log(cx^n)}{dx\sqrt{d+ex^2}}-\frac{2ex\left(a+b\log(cx^n)\right)}{d^2\sqrt{d+ex^2}}+\frac{(2ben)\int\frac{1}{\sqrt{d+ex^2}}\,dx}{d^2}\\
&= -\frac{bn\sqrt{d+ex^2}}{d^2x}-\frac{a+b\log(cx^n)}{dx\sqrt{d+ex^2}}-\frac{2ex\left(a+b\log(cx^n)\right)}{d^2\sqrt{d+ex^2}}+\frac{(2ben)\,\mathrm{Subst}\left(\int\frac{1}{1-ex^2}\,dx,x,\frac{}{\sqrt{d\cdots}}\right.}{d^2}\\
&= -\frac{bn\sqrt{d+ex^2}}{d^2x}+\frac{2b\sqrt{e}\,n\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{d^2}-\frac{a+b\log(cx^n)}{dx\sqrt{d+ex^2}}-\frac{2ex\left(a+b\log(cx^n)\right)}{d^2\sqrt{d+ex^2}}
\end{aligned}
$$

Mathematica [A] time = 0.13, size = 103, normalized size = 0.94

$$
\frac{-ad-2aex^2-b\left(d+2ex^2\right)\log(cx^n)+2b\sqrt{e}\,nx\sqrt{d+ex^2}\,\log\left(\sqrt{e}\,\sqrt{d+ex^2}\,+ex\right)-bdn-benx^2}{d^2x\sqrt{d+ex^2}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^(3/2)),x]
```

```
[Out] (-(a*d) - b*d*n - 2*a*e*x^2 - b*e*n*x^2 - b*(d + 2*e*x^2)*Log[c*x^n] + 2*b*
Sqrt[e]*n*x*Sqrt[d + e*x^2]*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(d^2*x*Sqrt
[d + e*x^2])
```

fricas [A] time = 0.46, size = 241, normalized size = 2.19

$$
\left[\frac{\left(benx^3+bdnx\right)\sqrt{e}\,\log\left(-2\,ex^2-2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)-\left(bdn+(ben+2\,ae)x^2+ad+\left(2\,bex^2+bd\right)\log(c)+\left(2\cdots\right.\right.}{d^2ex^3+d^3x}\right.
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [((b*e*n*x^3 + b*d*n*x)*sqrt(e)*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x
- d) - (b*d*n + (b*e*n + 2*a*e)*x^2 + a*d + (2*b*e*x^2 + b*d)*log(c) + (2*b
```

```
*e*n*x^2 + b*d*n)*log(x))*sqrt(e*x^2 + d))/(d^2*e*x^3 + d^3*x), -(2*(b*e*n*
x^3 + b*d*n*x)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (b*d*n + (b*e*
n + 2*a*e)*x^2 + a*d + (2*b*e*x^2 + b*d)*log(c) + (2*b*e*n*x^2 + b*d*n)*log
(x))*sqrt(e*x^2 + d))/(d^2*e*x^3 + d^3*x)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right) + a}{\left(ex^2 + d\right)^{\frac{3}{2}} x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(3/2),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(3/2)*x^2), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right) + a}{\left(e\,x^2 + d\right)^{\frac{3}{2}} x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(e*x^2+d)^(3/2),x)
[Out] int((b*ln(c*x^n)+a)/x^2/(e*x^2+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a\left(\frac{2\,ex}{\sqrt{ex^2 + d}\,d^2} + \frac{1}{\sqrt{ex^2 + d}\,dx}\right) + b\int \frac{\log(c) + \log\left(x^n\right)}{\left(ex^4 + dx^2\right)\sqrt{ex^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(3/2),x, algorithm="maxima")
[Out] -a*(2*e*x/(sqrt(e*x^2 + d)*d^2) + 1/(sqrt(e*x^2 + d)*d*x)) + b*integrate((l
og(c) + log(x^n))/((e*x^4 + d*x^2)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\ln\left(c\,x^n\right)}{x^2\,\left(e\,x^2 + d\right)^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)^(3/2)),x)
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\log\left(cx^n\right)}{x^2\left(d + ex^2\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x**2+d)**(3/2),x)
[Out] Integral((a + b*log(c*x**n))/(x**2*(d + e*x**2)**(3/2)), x)
```

3.295 $\int \frac{a+b\log(cx^n)}{x^4\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=176

$$\frac{8e^2x\left(a+b\log\left(cx^n\right)\right)}{3d^3\sqrt{d+ex^2}}+\frac{4e\left(a+b\log\left(cx^n\right)\right)}{3d^2x\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{3dx^3\sqrt{d+ex^2}}-\frac{8be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^3}+\frac{14ben\sqrt{d+ex^2}}{9d^3x}-\frac{bn\sqrt{d+}}{9d^2x}$$

```
[Out] -8/3*b*e^(3/2)*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/d^3+1/3*(-a-b*ln(c*x^n)
)/d/x^3/(e*x^2+d)^(1/2)+4/3*e*(a+b*ln(c*x^n))/d^2/x/(e*x^2+d)^(1/2)+8/3*e^2
*x*(a+b*ln(c*x^n))/d^3/(e*x^2+d)^(1/2)-1/9*b*n*(e*x^2+d)^(1/2)/d^2/x^3+14/9
*b*e*n*(e*x^2+d)^(1/2)/d^3/x
```

Rubi [A] time = 0.17, antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {271, 191, 2350, 12, 1265, 451, 217, 206}

$$\frac{8e^2x\left(a+b\log\left(cx^n\right)\right)}{3d^3\sqrt{d+ex^2}}+\frac{4e\left(a+b\log\left(cx^n\right)\right)}{3d^2x\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{3dx^3\sqrt{d+ex^2}}-\frac{8be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^3}+\frac{14ben\sqrt{d+ex^2}}{9d^3x}-\frac{bn\sqrt{d+}}{9d^2x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^(3/2)),x]
```

```
[Out] -(b*n*Sqrt[d + e*x^2])/(9*d^2*x^3) + (14*b*e*n*Sqrt[d + e*x^2])/(9*d^3*x) -
 (8*b*e^(3/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d^3) - (a + b*Log[
c*x^n])/(3*d*x^3*Sqrt[d + e*x^2]) + (4*e*(a + b*Log[c*x^n]))/(3*d^2*x*Sqrt[
d + e*x^2]) + (8*e^2*x*(a + b*Log[c*x^n]))/(3*d^3*Sqrt[d + e*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4\left(d+ex^2\right)^{3/2}}\,dx = -\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e\left(a+b\log(cx^n)\right)}{3d^2x\sqrt{d+ex^2}}+\frac{8e^2x\left(a+b\log(cx^n)\right)}{3d^3\sqrt{d+ex^2}}-(bn)\int \frac{-d^2+4dex^2}{3d^3x^4\sqrt{d}}$$

$$= -\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e\left(a+b\log(cx^n)\right)}{3d^2x\sqrt{d+ex^2}}+\frac{8e^2x\left(a+b\log(cx^n)\right)}{3d^3\sqrt{d+ex^2}}-\frac{(bn)\int \frac{-d^2+4dex^2+8e^2x}{x^4\sqrt{d+ex^2}}}{3d^3}$$

$$= -\frac{bn\sqrt{d+ex^2}}{9d^2x^3}-\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e\left(a+b\log(cx^n)\right)}{3d^2x\sqrt{d+ex^2}}+\frac{8e^2x\left(a+b\log(cx^n)\right)}{3d^3\sqrt{d+ex^2}}+\frac{(bn)}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{9d^2x^3}+\frac{14ben\sqrt{d+ex^2}}{9d^3x}-\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e\left(a+b\log(cx^n)\right)}{3d^2x\sqrt{d+ex^2}}+\frac{8e^2x\left(a+\right.}{3d^3\sqrt{}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{9d^2x^3}+\frac{14ben\sqrt{d+ex^2}}{9d^3x}-\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e\left(a+b\log(cx^n)\right)}{3d^2x\sqrt{d+ex^2}}+\frac{8e^2x\left(a+\right.}{3d^3\sqrt{}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{9d^2x^3}+\frac{14ben\sqrt{d+ex^2}}{9d^3x}-\frac{8be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^3}-\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e\left(a\right.}{3d^2}$$

Mathematica [A] time = 0.17, size = 144, normalized size = 0.82

$$\frac{-3ad^2+12adex^2+24ae^2x^4-3b\left(d^2-4dex^2-8e^2x^4\right)\log(cx^n)-bd^2n-24be^{3/2}nx^3\sqrt{d+ex^2}\log\left(\sqrt{e}\sqrt{d+e}\right.}{9d^3x^3\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^(3/2)),x]
```

```
[Out] (-3*a*d^2 - b*d^2*n + 12*a*d*e*x^2 + 13*b*d*e*n*x^2 + 24*a*e^2*x^4 + 14*b*e
^2*n*x^4 - 3*b*(d^2 - 4*d*e*x^2 - 8*e^2*x^4)*Log[c*x^n] - 24*b*e^(3/2)*n*x^
3*Sqrt[d + e*x^2]*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(9*d^3*x^3*Sqrt[d + e
*x^2])
```

fricas [A] time = 0.49, size = 370, normalized size = 2.10

$$\left[\frac{12\left(be^2nx^5 + bdenx^3\right)\sqrt{e}\log\left(-2\,ex^2 + 2\,\sqrt{ex^2+d}\,\sqrt{e}\,x - d\right) + \left(2\left(7\,be^2n + 12\,ae^2\right)x^4 - bd^2n - 3\,ad^2 + (13\,bden}{9\left(d^3ex^5 + d^4x^3\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/9*(12*(b*e^2*n*x^5 + b*d*e*n*x^3)*sqrt(e)*log(-2*e*x^2 + 2*sqrt(e*x^2 +
d)*sqrt(e)*x - d) + (2*(7*b*e^2*n + 12*a*e^2)*x^4 - b*d^2*n - 3*a*d^2 + (13
*b*d*e*n + 12*a*d*e)*x^2 + 3*(8*b*e^2*x^4 + 4*b*d*e*x^2 - b*d^2)*log(c) + 3
*(8*b*e^2*n*x^4 + 4*b*d*e*n*x^2 - b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^3*e*
x^5 + d^4*x^3), 1/9*(24*(b*e^2*n*x^5 + b*d*e*n*x^3)*sqrt(-e)*arctan(sqrt(-e
)*x/sqrt(e*x^2 + d)) + (2*(7*b*e^2*n + 12*a*e^2)*x^4 - b*d^2*n - 3*a*d^2 +
(13*b*d*e*n + 12*a*d*e)*x^2 + 3*(8*b*e^2*x^4 + 4*b*d*e*x^2 - b*d^2)*log(c)
+ 3*(8*b*e^2*n*x^4 + 4*b*d*e*n*x^2 - b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^3
*e*x^5 + d^4*x^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right) + a}{\left(ex^2 + d\right)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(3/2)*x^4), x)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right) + a}{\left(e\,x^2 + d\right)^{\frac{3}{2}}\,x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^4/(e*x^2+d)^(3/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^4/(e*x^2+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\,a\left(\frac{8\,e^2x}{\sqrt{ex^2+d}\,d^3} + \frac{4\,e}{\sqrt{ex^2+d}\,d^2x} - \frac{1}{\sqrt{ex^2+d}\,dx^3}\right) + b\int \frac{\log(c) + \log\left(x^n\right)}{\left(ex^6 + dx^4\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(8*e^2*x/(sqrt(e*x^2 + d)*d^3) + 4*e/(sqrt(e*x^2 + d)*d^2*x) - 1/(sqr
t(e*x^2 + d)*d*x^3)) + b*integrate((log(c) + log(x^n))/((e*x^6 + d*x^4)*sqr
t(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^4\,\left(e\,x^2+d\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)^(3/2)),x)
[Out] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x**2+d)**(3/2),x)
[Out] Timed out
```

3.296 $\int \frac{a+b\log(cx^n)}{x^6\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=236

$$-\frac{16e^3x\left(a+b\log\left(cx^n\right)\right)}{5d^4\sqrt{d+ex^2}}-\frac{8e^2\left(a+b\log\left(cx^n\right)\right)}{5d^3x\sqrt{d+ex^2}}+\frac{2e\left(a+b\log\left(cx^n\right)\right)}{5d^2x^3\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{5dx^5\sqrt{d+ex^2}}+\frac{16be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{5d^4}-$$

```
[Out] 16/5*b*e^(5/2)*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/d^4+1/5*(-a-b*ln(c*x^n)
)/d/x^5/(e*x^2+d)^(1/2)+2/5*e*(a+b*ln(c*x^n))/d^2/x^3/(e*x^2+d)^(1/2)-8/5*e
^2*(a+b*ln(c*x^n))/d^3/x/(e*x^2+d)^(1/2)-16/5*e^3*x*(a+b*ln(c*x^n))/d^4/(e*
x^2+d)^(1/2)-1/25*b*n*(e*x^2+d)^(1/2)/d^2/x^5+14/75*b*e*n*(e*x^2+d)^(1/2)/d
^3/x^3-148/75*b*e^2*n*(e*x^2+d)^(1/2)/d^4/x
```

Rubi [A] time = 0.27, antiderivative size = 236, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {271, 191, 2350, 12, 1807, 1585, 1265, 451, 217, 206}

$$-\frac{16e^3x\left(a+b\log\left(cx^n\right)\right)}{5d^4\sqrt{d+ex^2}}-\frac{8e^2\left(a+b\log\left(cx^n\right)\right)}{5d^3x\sqrt{d+ex^2}}+\frac{2e\left(a+b\log\left(cx^n\right)\right)}{5d^2x^3\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{5dx^5\sqrt{d+ex^2}}-\frac{148be^2n\sqrt{d+ex^2}}{75d^4x}+\frac{16be^{5/2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^6*(d + e*x^2)^(3/2)),x]
```

```
[Out] -(b*n*Sqrt[d + e*x^2])/(25*d^2*x^5) + (14*b*e*n*Sqrt[d + e*x^2])/(75*d^3*x^
3) - (148*b*e^2*n*Sqrt[d + e*x^2])/(75*d^4*x) + (16*b*e^(5/2)*n*ArcTanh[(Sq
rt[e]*x)/Sqrt[d + e*x^2]])/(5*d^4) - (a + b*Log[c*x^n])/(5*d*x^5*Sqrt[d + e
*x^2]) + (2*e*(a + b*Log[c*x^n]))/(5*d^2*x^3*Sqrt[d + e*x^2]) - (8*e^2*(a +
 b*Log[c*x^n]))/(5*d^3*x*Sqrt[d + e*x^2]) - (16*e^3*x*(a + b*Log[c*x^n]))/(
5*d^4*Sqrt[d + e*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
```

```
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 1585

```
Int[(u_.)*(x_)^(m_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.) + (c_.)*(x_)^(r_.
))^(n_.), x_Symbol] :> Int[u*x^(m + n*p)*(a + b*x^(q - p) + c*x^(r - p))^n,
 x] /; FreeQ[{a, b, c, m, p, q, r}, x] && IntegerQ[n] && PosQ[q - p] && Pos
Q[r - p]
```

Rule 1807

```
Int[(Pq_)*((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{
Q = PolynomialQuotient[Pq, c*x, x], R = PolynomialRemainder[Pq, c*x, x]}, S
imp[(R*(c*x)^(m + 1)*(a + b*x^2)^(p + 1))/(a*c*(m + 1)), x] + Dist[1/(a*c*(
m + 1)), Int[(c*x)^(m + 1)*(a + b*x^2)^p*ExpandToSum[a*c*(m + 1)*Q - b*R*(m
 + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, b, c, p}, x] && PolyQ[Pq, x] && LtQ
[m, -1] && (IntegerQ[2*p] || NeQ[Expon[Pq, x], 1])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^6\left(d+ex^2\right)^{3/2}}\,dx = -\frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}} + \frac{2e\left(a+b\log(cx^n)\right)}{5d^2x^3\sqrt{d+ex^2}} - \frac{8e^2\left(a+b\log(cx^n)\right)}{5d^3x\sqrt{d+ex^2}} - \frac{16e^3x\left(a+b\log(cx^n)\right)}{5d^4\sqrt{d+ex^2}} -$$

$$= -\frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}} + \frac{2e\left(a+b\log(cx^n)\right)}{5d^2x^3\sqrt{d+ex^2}} - \frac{8e^2\left(a+b\log(cx^n)\right)}{5d^3x\sqrt{d+ex^2}} - \frac{16e^3x\left(a+b\log(cx^n)\right)}{5d^4\sqrt{d+ex^2}} -$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5} - \frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}} + \frac{2e\left(a+b\log(cx^n)\right)}{5d^2x^3\sqrt{d+ex^2}} - \frac{8e^2\left(a+b\log(cx^n)\right)}{5d^3x\sqrt{d+ex^2}} - \frac{16e^3x\left(a\right.}{5d^4}$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5} - \frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}} + \frac{2e\left(a+b\log(cx^n)\right)}{5d^2x^3\sqrt{d+ex^2}} - \frac{8e^2\left(a+b\log(cx^n)\right)}{5d^3x\sqrt{d+ex^2}} - \frac{16e^3x\left(a\right.}{5d^4}$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5} + \frac{14ben\sqrt{d+ex^2}}{75d^3x^3} - \frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}} + \frac{2e\left(a+b\log(cx^n)\right)}{5d^2x^3\sqrt{d+ex^2}} - \frac{8e^2\left(a+b\log\right.}{5d^3x\sqrt{d+}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5} + \frac{14ben\sqrt{d+ex^2}}{75d^3x^3} - \frac{148be^2n\sqrt{d+ex^2}}{75d^4x} - \frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}} + \frac{2e\left(a+b\log(c\right.}{5d^2x^3\sqrt{d+e}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5} + \frac{14ben\sqrt{d+ex^2}}{75d^3x^3} - \frac{148be^2n\sqrt{d+ex^2}}{75d^4x} - \frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}} + \frac{2e\left(a+b\log(c\right.}{5d^2x^3\sqrt{d+e}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5} + \frac{14ben\sqrt{d+ex^2}}{75d^3x^3} - \frac{148be^2n\sqrt{d+ex^2}}{75d^4x} + \frac{16be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{5d^4} - \frac{a+}{5dx}$$

Mathematica [A] time = 0.20, size = 180, normalized size = 0.76

$$\frac{-15ad^3+30ad^2ex^2-120ade^2x^4-240ae^3x^6-15b\left(d^3-2d^2ex^2+8de^2x^4+16e^3x^6\right)\log(cx^n)-3bd^3n+11bd^2enx}{75d^4x^5\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^6*(d + e*x^2)^(3/2)),x]
```

```
[Out] (-15*a*d^3 - 3*b*d^3*n + 30*a*d^2*e*x^2 + 11*b*d^2*e*n*x^2 - 120*a*d*e^2*x^
4 - 134*b*d*e^2*n*x^4 - 240*a*e^3*x^6 - 148*b*e^3*n*x^6 - 15*b*(d^3 - 2*d^2
*e*x^2 + 8*d*e^2*x^4 + 16*e^3*x^6)*Log[c*x^n] + 240*b*e^(5/2)*n*x^5*Sqrt[d
+ e*x^2]*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(75*d^4*x^5*Sqrt[d + e*x^2])
```

fricas [A] time = 0.52, size = 473, normalized size = 2.00

$$\left[\frac{120\left(be^3nx^7+bde^2nx^5\right)\sqrt{e}\log\left(-2ex^2-2\sqrt{ex^2+d}\sqrt{e}x-d\right)-\left(4\left(37be^3n+60ae^3\right)x^6+3bd^3n+2\left(67bde^2n\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^6/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/75*(120*(b*e^3*n*x^7 + b*d*e^2*n*x^5)*sqrt(e)*log(-2*e*x^2 - 2*sqrt(e*x^
2 + d)*sqrt(e)*x - d) - (4*(37*b*e^3*n + 60*a*e^3)*x^6 + 3*b*d^3*n + 2*(67*
b*d*e^2*n + 60*a*d*e^2)*x^4 + 15*a*d^3 - (11*b*d^2*e*n + 30*a*d^2*e)*x^2 +
15*(16*b*e^3*x^6 + 8*b*d*e^2*x^4 - 2*b*d^2*e*x^2 + b*d^3)*log(c) + 15*(16*b
*e^3*n*x^6 + 8*b*d*e^2*n*x^4 - 2*b*d^2*e*n*x^2 + b*d^3*n)*log(x))*sqrt(e*x^
2 + d))/(d^4*e*x^7 + d^5*x^5), -1/75*(240*(b*e^3*n*x^7 + b*d*e^2*n*x^5)*sqr
```

```
t(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (4*(37*b*e^3*n + 60*a*e^3)*x^6 +
 3*b*d^3*n + 2*(67*b*d*e^2*n + 60*a*d*e^2)*x^4 + 15*a*d^3 - (11*b*d^2*e*n +
 30*a*d^2*e)*x^2 + 15*(16*b*e^3*x^6 + 8*b*d*e^2*x^4 - 2*b*d^2*e*x^2 + b*d^3
)*log(c) + 15*(16*b*e^3*n*x^6 + 8*b*d*e^2*n*x^4 - 2*b*d^2*e*n*x^2 + b*d^3*n
)*log(x))*sqrt(e*x^2 + d))/(d^4*e*x^7 + d^5*x^5)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b \log(cx^n) + a}{(ex^2 + d)^{\frac{3}{2}} x^6} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^6/(e*x^2+d)^(3/2),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(3/2)*x^6), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{b \ln(c\, x^n) + a}{(e\, x^2 + d)^{\frac{3}{2}}\, x^6} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^6/(e*x^2+d)^(3/2),x)
[Out] int((b*ln(c*x^n)+a)/x^6/(e*x^2+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{5}\, a\left(\frac{16\, e^3 x}{\sqrt{ex^2+d}\, d^4} + \frac{8\, e^2}{\sqrt{ex^2+d}\, d^3 x} - \frac{2\, e}{\sqrt{ex^2+d}\, d^2 x^3} + \frac{1}{\sqrt{ex^2+d}\, d x^5}\right) + b \int \frac{\log(c) + \log(x^n)}{(ex^8 + dx^6)\sqrt{ex^2+d}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^6/(e*x^2+d)^(3/2),x, algorithm="maxima")
[Out] -1/5*a*(16*e^3*x/(sqrt(e*x^2 + d)*d^4) + 8*e^2/(sqrt(e*x^2 + d)*d^3*x) - 2*
e/(sqrt(e*x^2 + d)*d^2*x^3) + 1/(sqrt(e*x^2 + d)*d*x^5)) + b*integrate((log
(c) + log(x^n))/((e*x^8 + d*x^6)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b\, \ln(c\, x^n)}{x^6\, (e\, x^2 + d)^{3/2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^6*(d + e*x^2)^(3/2)),x)
[Out] int((a + b*log(c*x^n))/(x^6*(d + e*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**6/(e*x**2+d)**(3/2),x)
[Out] Timed out
```

3.297 $\int \frac{x^7(a+b\log(cx^n))}{(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=212

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4\left(d+ex^2\right)^{3/2}}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}-\frac{3d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^4}-\frac{16bd^{3/2}}{}$$

```
[Out] -1/9*b*n*(e*x^2+d)^(3/2)/e^4-16/3*b*d^(3/2)*n*arctanh((e*x^2+d)^(1/2)/d^(1/
2))/e^4+1/3*d^3*(a+b*ln(c*x^n))/e^4/(e*x^2+d)^(3/2)+1/3*(e*x^2+d)^(3/2)*(a+
b*ln(c*x^n))/e^4-1/3*b*d^2*n/e^4/(e*x^2+d)^(1/2)-3*d^2*(a+b*ln(c*x^n))/e^4/
(e*x^2+d)^(1/2)+8/3*b*d*n*(e*x^2+d)^(1/2)/e^4-3*d*(a+b*ln(c*x^n))*(e*x^2+d)
^(1/2)/e^4
```

Rubi [A] time = 0.32, antiderivative size = 212, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {266, 43, 2350, 12, 1799, 1619, 63, 208}

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4\left(d+ex^2\right)^{3/2}}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}-\frac{3d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^4}-\frac{bd^2}{3e^4\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^7*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] -(b*d^2*n)/(3*e^4*Sqrt[d + e*x^2]) + (8*b*d*n*Sqrt[d + e*x^2])/(3*e^4) - (b
*n*(d + e*x^2)^(3/2))/(9*e^4) - (16*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqr
t[d]])/(3*e^4) + (d^3*(a + b*Log[c*x^n]))/(3*e^4*(d + e*x^2)^(3/2)) - (3*d^
2*(a + b*Log[c*x^n]))/(e^4*Sqrt[d + e*x^2]) - (3*d*Sqrt[d + e*x^2]*(a + b*L
og[c*x^n]))/e^4 + ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1619

```
Int[((Px_)*((c_.) + (d_.)*(x_))^(n_.))/((a_.) + (b_.)*(x_)), x_Symbol] :> I
nt[ExpandIntegrand[1/Sqrt[c + d*x], (Px*(c + d*x)^(n + 1/2))/(a + b*x), x],
 x] /; FreeQ[{a, b, c, d, n}, x] && PolyQ[Px, x] && ILtQ[n + 1/2, 0] && GtQ
[Expon[Px, x], 2]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^7 \left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{5/2}}\,dx = \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}} - \frac{3d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4} + \frac{(d}{}$$

$$= \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}} - \frac{3d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4} + \frac{(d}{}$$

$$= \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}} - \frac{3d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4} + \frac{(d}{}$$

$$= \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}} - \frac{3d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4} + \frac{(d}{}$$

$$= -\frac{bd^2n}{3e^4\sqrt{d+ex^2}} + \frac{7bdn\sqrt{d+ex^2}}{3e^4} + \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}} -$$

$$= -\frac{bd^2n}{3e^4\sqrt{d+ex^2}} + \frac{7bdn\sqrt{d+ex^2}}{3e^4} + \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}} -$$

$$= -\frac{bd^2n}{3e^4\sqrt{d+ex^2}} + \frac{8bdn\sqrt{d+ex^2}}{3e^4} - \frac{bn\left(d+ex^2\right)^{3/2}}{9e^4} - \frac{16bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^4} +$$

Mathematica [A] time = 0.27, size = 240, normalized size = 1.13

$$\frac{-48ad^3-72ad^2ex^2-18ade^2x^4+3ae^3x^6-3b\left(16d^3+24d^2ex^2+6de^2x^4-e^3x^6\right)\log\left(cx^n\right)-48bd^{3/2}enx^2\sqrt{d+ex^2}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^7*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (-48*a*d^3 + 20*b*d^3*n - 72*a*d^2*e*x^2 + 42*b*d^2*e*n*x^2 - 18*a*d*e^2*x^
4 + 21*b*d*e^2*n*x^4 + 3*a*e^3*x^6 - b*e^3*n*x^6 + 48*b*d^(3/2)*n*(d + e*x^
2)^(3/2)*Log[x] - 3*b*(16*d^3 + 24*d^2*e*x^2 + 6*d*e^2*x^4 - e^3*x^6)*Log[c
*x^n] - 48*b*d^(5/2)*n*Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[d + e*x^2]] - 4
8*b*d^(3/2)*e*n*x^2*Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(9*e^
4*(d + e*x^2)^(3/2))
```

fricas [A] time = 0.54, size = 504, normalized size = 2.38

$$\left[\frac{24\left(bde^2nx^4+2\,bd^2enx^2+bd^3n\right)\sqrt{d}\,\log\left(-\frac{ex^2-2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right)-\left(\left(be^3n-3\,ae^3\right)x^6-20\,bd^3n-3\left(7\,bde^2n-6\,ad\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/9*(24*(b*d*e^2*n*x^4 + 2*b*d^2*e*n*x^2 + b*d^3*n)*sqrt(d)*log(-(e*x^2 -
2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) - ((b*e^3*n - 3*a*e^3)*x^6 - 20*b*d^3
*n - 3*(7*b*d*e^2*n - 6*a*d*e^2)*x^4 + 48*a*d^3 - 6*(7*b*d^2*e*n - 12*a*d^2
*e)*x^2 - 3*(b*e^3*x^6 - 6*b*d*e^2*x^4 - 24*b*d^2*e*x^2 - 16*b*d^3)*log(c)
- 3*(b*e^3*n*x^6 - 6*b*d*e^2*n*x^4 - 24*b*d^2*e*n*x^2 - 16*b*d^3*n)*log(x))
*sqrt(e*x^2 + d))/(e^6*x^4 + 2*d*e^5*x^2 + d^2*e^4), 1/9*(48*(b*d*e^2*n*x^4
 + 2*b*d^2*e*n*x^2 + b*d^3*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - (
(b*e^3*n - 3*a*e^3)*x^6 - 20*b*d^3*n - 3*(7*b*d*e^2*n - 6*a*d*e^2)*x^4 + 48
*a*d^3 - 6*(7*b*d^2*e*n - 12*a*d^2*e)*x^2 - 3*(b*e^3*x^6 - 6*b*d*e^2*x^4 -
24*b*d^2*e*x^2 - 16*b*d^3)*log(c) - 3*(b*e^3*n*x^6 - 6*b*d*e^2*n*x^4 - 24*b
*d^2*e*n*x^2 - 16*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/(e^6*x^4 + 2*d*e^5*x^2
+ d^2*e^4)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^7}{\left(ex^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^7/(e*x^2 + d)^(5/2), x)
```

maple [F] time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)x^7}{\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

[Out] int(x^7*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)

maxima [A] time = 1.61, size = 246, normalized size = 1.16

$$\frac{1}{9}\,bn\left(\frac{24\,d^{\frac{3}{2}}\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{e^4}-\frac{3\,d^2}{\sqrt{ex^2+d}\,e^4}-\frac{\left(ex^2+d\right)^{\frac{3}{2}}-24\,\sqrt{ex^2+d}\,d}{e^4}\right)+\frac{1}{3}\left(\frac{x^6}{\left(ex^2+d\right)^{\frac{3}{2}}e}-\frac{6\,dx^4}{\left(ex^2+d\right)^{\frac{3}{2}}e^2}-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/9*b*n*(24*d^(3/2)*log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + sqrt
(d)))/e^4 - 3*d^2/(sqrt(e*x^2 + d)*e^4) - ((e*x^2 + d)^(3/2) - 24*sqrt(e*x^
2 + d)*d)/e^4) + 1/3*(x^6/((e*x^2 + d)^(3/2)*e) - 6*d*x^4/((e*x^2 + d)^(3/2
)*e^2) - 24*d^2*x^2/((e*x^2 + d)^(3/2)*e^3) - 16*d^3/((e*x^2 + d)^(3/2)*e^4
))*b*log(c*x^n) + 1/3*(x^6/((e*x^2 + d)^(3/2)*e) - 6*d*x^4/((e*x^2 + d)^(3/
2)*e^2) - 24*d^2*x^2/((e*x^2 + d)^(3/2)*e^3) - 16*d^3/((e*x^2 + d)^(3/2)*e^
4))*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^7\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(e\,x^2+d\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^7*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2),x)
```

```
[Out] int((x^7*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**7*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.298 $\int \frac{x^5(a+b\log(cx^n))}{(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=155

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3e^3\left(d+ex^2\right)^{3/2}}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{bdn}{3e^3\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{e^3}+\frac{8b\sqrt{d}\,n\tan}{}$$

```
[Out] -1/3*d^2*(a+b*ln(c*x^n))/e^3/(e*x^2+d)^(3/2)+8/3*b*n*arctanh((e*x^2+d)^(1/2
)/d^(1/2))*d^(1/2)/e^3+1/3*b*d*n/e^3/(e*x^2+d)^(1/2)+2*d*(a+b*ln(c*x^n))/e^
3/(e*x^2+d)^(1/2)-b*n*(e*x^2+d)^(1/2)/e^3+(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/e
^3
```

Rubi [A] time = 0.23, antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {266, 43, 2350, 12, 1251, 897, 1261, 206}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3e^3\left(d+ex^2\right)^{3/2}}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{bdn}{3e^3\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{e^3}+\frac{8b\sqrt{d}\,n\tan}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*d*n)/(3*e^3*Sqrt[d + e*x^2]) - (b*n*Sqrt[d + e*x^2])/e^3 + (8*b*Sqrt[d]*
n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e^3) - (d^2*(a + b*Log[c*x^n]))/(3*e
^3*(d + e*x^2)^(3/2)) + (2*d*(a + b*Log[c*x^n]))/(e^3*Sqrt[d + e*x^2]) + (S
qrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
```

```
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^5\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{5/2}}dx = -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3} - (bn)\int$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{(bn)\int}{}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{(bn)\,\mathrm{Sub}}{}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{(bn)\,\mathrm{Sub}}{}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3} - \frac{(bn)\,\mathrm{Sub}}{}$$

$$= \frac{bdn}{3e^3\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{e^3} - \frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex}}{}$$

$$= \frac{bdn}{3e^3\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{e^3} + \frac{8b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^3} - \frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d}{}$$

Mathematica [A] time = 0.22, size = 205, normalized size = 1.32

$$\sqrt{d+ex^2}\left(-\frac{d^2\left(a+b\left(\log\left(cx^n\right)-n\log(x)\right)\right)}{3e^3\left(d+ex^2\right)^2} + \frac{d\left(6a+6b\left(\log\left(cx^n\right)-n\log(x)\right)+bn\right)}{3e^3\left(d+ex^2\right)} + \frac{a+b\left(\log\left(cx^n\right)-n\log\right.}{e^3}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (-8*b*Sqrt[d]*n*Log[x])/(3*e^3) + (b*n*(8*d^2 + 12*d*e*x^2 + 3*e^2*x^4)*Log
[x])/(3*e^3*(d + e*x^2)^(3/2)) + Sqrt[d + e*x^2]*(-1/3*(d^2*(a + b*(-(n*Log
[x]) + Log[c*x^n])))/(e^3*(d + e*x^2)^2) + (a - b*n + b*(-(n*Log[x]) + Log[
c*x^n]))/e^3 + (d*(6*a + b*n + 6*b*(-(n*Log[x]) + Log[c*x^n])))/(3*e^3*(d +
 e*x^2))) + (8*b*Sqrt[d]*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(3*e^3)
```

fricas [A] time = 0.51, size = 401, normalized size = 2.59

$$\left[\frac{4\left(be^2nx^4+2\,bdenx^2+bd^2n\right)\sqrt{d}\,\log\left(-\frac{ex^2+2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right)-\left(3\left(be^2n-ae^2\right)x^4+2\,bd^2n-8\,ad^2+\left(5\,bden-12\right.\right.}{3\left(e^5x^4+2\,de^4x^2+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/3*(4*(b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(d)*log(-(e*x^2 + 2*sqr
t(e*x^2 + d)*sqrt(d) + 2*d)/x^2) - (3*(b*e^2*n - a*e^2)*x^4 + 2*b*d^2*n - 8
```

```
*a*d^2 + (5*b*d*e*n - 12*a*d*e)*x^2 - (3*b*e^2*x^4 + 12*b*d*e*x^2 + 8*b*d^2
)*log(c) - (3*b*e^2*n*x^4 + 12*b*d*e*n*x^2 + 8*b*d^2*n)*log(x))*sqrt(e*x^2
+ d))/(e^5*x^4 + 2*d*e^4*x^2 + d^2*e^3), -1/3*(8*(b*e^2*n*x^4 + 2*b*d*e*n*x
^2 + b*d^2*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (3*(b*e^2*n - a*e
^2)*x^4 + 2*b*d^2*n - 8*a*d^2 + (5*b*d*e*n - 12*a*d*e)*x^2 - (3*b*e^2*x^4 +
 12*b*d*e*x^2 + 8*b*d^2)*log(c) - (3*b*e^2*n*x^4 + 12*b*d*e*n*x^2 + 8*b*d^2
*n)*log(x))*sqrt(e*x^2 + d))/(e^5*x^4 + 2*d*e^4*x^2 + d^2*e^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log\left(cx^n\right) + a\right)x^5}{\left(ex^2 + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x^2 + d)^(5/2), x)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{\left(b \ln\left(c\,x^n\right) + a\right)x^5}{\left(e\,x^2 + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^5*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

maxima [A] time = 1.34, size = 193, normalized size = 1.25

$$-\frac{1}{3}\,bn\left(\frac{4\,\sqrt{d}\,\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{e^3} + \frac{3\,\sqrt{ex^2+d}}{e^3} - \frac{d}{\sqrt{ex^2+d}\,e^3}\right) + \frac{1}{3}\left(\frac{3\,x^4}{\left(ex^2+d\right)^{\frac{3}{2}}e} + \frac{12\,dx^2}{\left(ex^2+d\right)^{\frac{3}{2}}e^2} + \frac{8\,d^2}{\left(ex^2+d\right)^{\frac{3}{2}}e^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3*b*n*(4*sqrt(d)*log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + sqrt
(d)))/e^3 + 3*sqrt(e*x^2 + d)/e^3 - d/(sqrt(e*x^2 + d)*e^3)) + 1/3*(3*x^4/(
(e*x^2 + d)^(3/2)*e) + 12*d*x^2/((e*x^2 + d)^(3/2)*e^2) + 8*d^2/((e*x^2 + d
)^(3/2)*e^3))*b*log(c*x^n) + 1/3*(3*x^4/((e*x^2 + d)^(3/2)*e) + 12*d*x^2/((
e*x^2 + d)^(3/2)*e^2) + 8*d^2/((e*x^2 + d)^(3/2)*e^3))*a
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^5\,\left(a + b\,\ln\left(c\,x^n\right)\right)}{{\left(e\,x^2 + d\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2),x)
```

```
[Out] int((x^5*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.299 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=108

$$-\frac{a+b\log(cx^n)}{e^2\sqrt{d+ex^2}}+\frac{d(a+b\log(cx^n))}{3e^2(d+ex^2)^{3/2}}-\frac{bn}{3e^2\sqrt{d+ex^2}}-\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3\sqrt{d}\,e^2}$$

```
[Out] 1/3*d*(a+b*ln(c*x^n))/e^2/(e*x^2+d)^(3/2)-2/3*b*n*arctanh((e*x^2+d)^(1/2)/d
^(1/2))/e^2/d^(1/2)-1/3*b*n/e^2/(e*x^2+d)^(1/2)+(-a-b*ln(c*x^n))/e^2/(e*x^2
+d)^(1/2)
```

Rubi [A] time = 0.16, antiderivative size = 108, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {266, 43, 2350, 12, 446, 78, 63, 208}

$$-\frac{a+b\log(cx^n)}{e^2\sqrt{d+ex^2}}+\frac{d(a+b\log(cx^n))}{3e^2(d+ex^2)^{3/2}}-\frac{bn}{3e^2\sqrt{d+ex^2}}-\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3\sqrt{d}\,e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] -(b*n)/(3*e^2*Sqrt[d + e*x^2]) - (2*b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(
3*Sqrt[d]*e^2) + (d*(a + b*Log[c*x^n]))/(3*e^2*(d + e*x^2)^(3/2)) - (a + b*
Log[c*x^n])/(e^2*Sqrt[d + e*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{5/2}}\,dx &= \frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{e^2\sqrt{d+ex^2}}-(bn)\int\frac{-2d-3ex^2}{3e^2x\left(d+ex^2\right)^{3/2}}\,dx\\
&= \frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{e^2\sqrt{d+ex^2}}-\frac{(bn)\int\frac{-2d-3ex^2}{x\left(d+ex^2\right)^{3/2}}\,dx}{3e^2}\\
&= \frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{e^2\sqrt{d+ex^2}}-\frac{(bn)\operatorname{Subst}\left(\int\frac{-2d-3ex}{x(d+ex)^{3/2}}\,dx,x,x^2\right)}{6e^2}\\
&= -\frac{bn}{3e^2\sqrt{d+ex^2}}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{e^2\sqrt{d+ex^2}}+\frac{(bn)\operatorname{Subst}\left(\int\frac{1}{x\sqrt{d+ex}}\,dx,x,\right.}{3e^2}\\
&= -\frac{bn}{3e^2\sqrt{d+ex^2}}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{e^2\sqrt{d+ex^2}}+\frac{(2bn)\operatorname{Subst}\left(\int\frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\right.}{3e^3}\\
&= -\frac{bn}{3e^2\sqrt{d+ex^2}}-\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3\sqrt{d}\,e^2}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{e^2\sqrt{d+ex^2}}
\end{aligned}$$

Mathematica [A] time = 0.28, size = 137, normalized size = 1.27

$$\frac{\frac{d\left(a+b\log\left(cx^n\right)-bn\log(x)\right)-\left(d+ex^2\right)\left(3a+3b\log\left(cx^n\right)-3bn\log(x)+bn\right)}{\left(d+ex^2\right)^{3/2}}-\frac{bn\log(x)\left(2d+3ex^2\right)}{\left(d+ex^2\right)^{3/2}}-\frac{2bn\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)}{\sqrt{d}}+\frac{2bn\log(x)}{\sqrt{d}}}{3e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] ((2*b*n*Log[x])/Sqrt[d] - (b*n*(2*d + 3*e*x^2)*Log[x])/(d + e*x^2)^(3/2) +
(d*(a - b*n*Log[x] + b*Log[c*x^n]) - (d + e*x^2)*(3*a + b*n - 3*b*n*Log[x]
+ 3*b*Log[c*x^n]))/(d + e*x^2)^(3/2) - (2*b*n*Log[d + Sqrt[d]*Sqrt[d + e*x^
2]])/Sqrt[d])/(3*e^2)
```

fricas [A] time = 0.48, size = 325, normalized size = 3.01

$$\left[\frac{\left(be^2nx^4+2\,bdenx^2+bd^2n\right)\sqrt{d}\,\log\left(-\frac{ex^2-2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right)-\left(bd^2n+2\,ad^2+(bden+3\,ade)x^2+\left(3\,bdex^2+2\,b\right.\right.}{3\left(de^4x^4+2\,d^2e^3x^2+d^3e^2\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/3*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(d)*log(-(e*x^2 - 2*sqrt(
e*x^2 + d)*sqrt(d) + 2*d)/x^2) - (b*d^2*n + 2*a*d^2 + (b*d*e*n + 3*a*d*e)*x
^2 + (3*b*d*e*x^2 + 2*b*d^2)*log(c) + (3*b*d*e*n*x^2 + 2*b*d^2*n)*log(x))*s
qrt(e*x^2 + d))/(d*e^4*x^4 + 2*d^2*e^3*x^2 + d^3*e^2), 1/3*(2*(b*e^2*n*x^4
+ 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - (b*d
^2*n + 2*a*d^2 + (b*d*e*n + 3*a*d*e)*x^2 + (3*b*d*e*x^2 + 2*b*d^2)*log(c) +
 (3*b*d*e*n*x^2 + 2*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d*e^4*x^4 + 2*d^2*e^
3*x^2 + d^3*e^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^3}{\left(ex^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^2 + d)^(5/2), x)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)x^3}{\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^3*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

maxima [A] time = 1.43, size = 137, normalized size = 1.27

$$\frac{1}{3}\,bn\left(\frac{\log\left(\frac{\sqrt{ex^2+d}-\sqrt{d}}{\sqrt{ex^2+d}+\sqrt{d}}\right)}{\sqrt{d}\,e^2}-\frac{1}{\sqrt{ex^2+d}\,e^2}\right)-\frac{1}{3}\,b\left(\frac{3\,x^2}{\left(ex^2+d\right)^{\frac{3}{2}}e}+\frac{2\,d}{\left(ex^2+d\right)^{\frac{3}{2}}e^2}\right)\log\left(cx^n\right)-\frac{1}{3}\,a\left(\frac{3\,x^2}{\left(ex^2+d\right)^{\frac{3}{2}}e}+\frac{2}{\left(ex^2+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*b*n*(log((sqrt(e*x^2 + d) - sqrt(d))/(sqrt(e*x^2 + d) + sqrt(d)))/(sqrt
(d)*e^2) - 1/(sqrt(e*x^2 + d)*e^2)) - 1/3*b*(3*x^2/((e*x^2 + d)^(3/2)*e) +
2*d/((e*x^2 + d)^(3/2)*e^2))*log(c*x^n) - 1/3*a*(3*x^2/((e*x^2 + d)^(3/2)*e
) + 2*d/((e*x^2 + d)^(3/2)*e^2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,(a+b\,\ln(c\,x^n))}{\left(e\,x^2+d\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2),x)
```

```
[Out] int((x^3*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2), x)
```

sympy [A] time = 57.19, size = 333, normalized size = 3.08

$$a\left(\begin{cases}\frac{x^4}{4d^{\frac{5}{2}}} & \text{for } e=0\\ \frac{d}{3e^2\left(d+ex^2\right)^{\frac{3}{2}}}-\frac{1}{e^2\sqrt{d+ex^2}} & \text{otherwise}\end{cases}\right)-bn\left(\begin{cases}\frac{x^4}{16d^{\frac{5}{2}}} \\ \frac{2d^4\sqrt{1+\frac{ex^2}{d}}}{6d^{\frac{9}{2}}e^2+6d^{\frac{7}{2}}e^3x^2}+\frac{d^4\log\left(\frac{ex^2}{d}\right)}{6d^{\frac{9}{2}}e^2+6d^{\frac{7}{2}}e^3x^2}-\frac{2d^4\log\left(\sqrt{1+\frac{ex^2}{d}}+1\right)}{6d^{\frac{9}{2}}e^2+6d^{\frac{7}{2}}e^3x^2}+\frac{d^3x^2\log\left(\frac{ex^2}{d}\right)}{6d^{\frac{9}{2}}e+6d^{\frac{7}{2}}e^2x^2}-\end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] a*Piecewise((x**4/(4*d**(5/2)), Eq(e, 0)), (d/(3*e**2*(d + e*x**2)**(3/2))
- 1/(e**2*sqrt(d + e*x**2)), True)) - b*n*Piecewise((x**4/(16*d**(5/2)), Eq
(e, 0)), (2*d**4*sqrt(1 + e*x**2/d)/(6*d**(9/2)*e**2 + 6*d**(7/2)*e**3*x**2
) + d**4*log(e*x**2/d)/(6*d**(9/2)*e**2 + 6*d**(7/2)*e**3*x**2) - 2*d**4*lo
g(sqrt(1 + e*x**2/d) + 1)/(6*d**(9/2)*e**2 + 6*d**(7/2)*e**3*x**2) + d**3*x
**2*log(e*x**2/d)/(6*d**(9/2)*e + 6*d**(7/2)*e**2*x**2) - 2*d**3*x**2*log(s
qrt(1 + e*x**2/d) + 1)/(6*d**(9/2)*e + 6*d**(7/2)*e**2*x**2) + asinh(sqrt(d
)/(sqrt(e)*x))/(sqrt(d)*e**2), True)) + b*Piecewise((x**4/(4*d**(5/2)), Eq(
e, 0)), (d/(3*e**2*(d + e*x**2)**(3/2)) - 1/(e**2*sqrt(d + e*x**2)), True))
*log(c*x**n)
```

3.300 $\int \frac{x(a+b\log(cx^n))}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=84

$$-\frac{a+b\log\left(cx^n\right)}{3e\left(d+ex^2\right)^{3/2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{3/2}e}+\frac{bn}{3de\sqrt{d+ex^2}}$$

```
[Out] -1/3*b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(3/2)/e+1/3*(-a-b*ln(c*x^n))/e/
(e*x^2+d)^(3/2)+1/3*b*n/d/e/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.09, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2338, 266, 51, 63, 208}

$$-\frac{a+b\log\left(cx^n\right)}{3e\left(d+ex^2\right)^{3/2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{3/2}e}+\frac{bn}{3de\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*n)/(3*d*e*Sqrt[d + e*x^2]) - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*d
^(3/2)*e) - (a + b*Log[c*x^n])/(3*e*(d + e*x^2)^(3/2))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
```

```
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{5/2}}\,dx &= -\frac{a+b\log\left(cx^n\right)}{3e\left(d+ex^2\right)^{3/2}}+\frac{(bn)\int \frac{1}{x\left(d+ex^2\right)^{3/2}}\,dx}{3e}\\
&= -\frac{a+b\log\left(cx^n\right)}{3e\left(d+ex^2\right)^{3/2}}+\frac{(bn)\,\text{Subst}\left(\int \frac{1}{x(d+ex)^{3/2}}\,dx,x,x^2\right)}{6e}\\
&= \frac{bn}{3de\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{3e\left(d+ex^2\right)^{3/2}}+\frac{(bn)\,\text{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,x,x^2\right)}{6de}\\
&= \frac{bn}{3de\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{3e\left(d+ex^2\right)^{3/2}}+\frac{(bn)\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ex^2}\right)}{3de^2}\\
&= \frac{bn}{3de\sqrt{d+ex^2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{3/2}e}-\frac{a+b\log\left(cx^n\right)}{3e\left(d+ex^2\right)^{3/2}}
\end{aligned}$$

Mathematica [A] time = 0.24, size = 97, normalized size = 1.15

$$-\frac{\frac{a}{\left(d+ex^2\right)^{3/2}}+\frac{b\log\left(cx^n\right)}{\left(d+ex^2\right)^{3/2}}+\frac{bn\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)}{d^{3/2}}-\frac{bn\log(x)}{d^{3/2}}-\frac{bn}{d\sqrt{d+ex^2}}}{3e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] -1/3*(a/(d + e*x^2)^(3/2) - (b*n)/(d*Sqrt[d + e*x^2]) - (b*n*Log[x])/d^(3/2
) + (b*Log[c*x^n])/(d + e*x^2)^(3/2) + (b*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]
])/d^(3/2))/e
```

fricas [A] time = 0.48, size = 267, normalized size = 3.18

$$\left[\frac{\left(be^2nx^4+2\,bdenx^2+bd^2n\right)\sqrt{d}\,\log\left(-\frac{ex^2-2\,\sqrt{ex^2+d}\,\sqrt{d}+2\,d}{x^2}\right)+2\left(bdenx^2-bd^2n\log(x)+bd^2n-bd^2\log(c)-ad^2\right)}{6\left(d^2e^3x^4+2\,d^3e^2x^2+d^4e\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/6*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(d)*log(-(e*x^2 - 2*sqrt(
e*x^2 + d)*sqrt(d) + 2*d)/x^2) + 2*(b*d*e*n*x^2 - b*d^2*n*log(x) + b*d^2*n
- b*d^2*log(c) - a*d^2)*sqrt(e*x^2 + d))/(d^2*e^3*x^4 + 2*d^3*e^2*x^2 + d^4
*e), 1/3*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(-d)*arctan(sqrt(-d)/
```

```
sqrt(e*x^2 + d)) + (b*d*e*n*x^2 - b*d^2*n*log(x) + b*d^2*n - b*d^2*log(c) -
 a*d^2)*sqrt(e*x^2 + d))/(d^2*e^3*x^4 + 2*d^3*e^2*x^2 + d^4*e)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x}{\left(ex^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^2 + d)^(5/2), x)
```

maple [F] time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)x}{\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

maxima [A] time = 0.70, size = 75, normalized size = 0.89

$$-\frac{bn\left(\frac{\operatorname{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{d^{\frac{3}{2}}}-\frac{1}{\sqrt{ex^2+d}\,d}\right)}{3\,e}-\frac{b\log\left(cx^n\right)}{3\left(ex^2+d\right)^{\frac{3}{2}}e}-\frac{a}{3\left(ex^2+d\right)^{\frac{3}{2}}e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3*b*n*(arcsinh(d/(sqrt(d*e)*abs(x)))/d^(3/2) - 1/(sqrt(e*x^2 + d)*d))/e
- 1/3*b*log(c*x^n)/((e*x^2 + d)^(3/2)*e) - 1/3*a/((e*x^2 + d)^(3/2)*e)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(e\,x^2+d\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2),x)
```

```
[Out] int((x*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2), x)
```

sympy [B] time = 33.60, size = 245, normalized size = 2.92

$$-\frac{a}{3e\left(d+ex^2\right)^{\frac{3}{2}}}+\frac{2bd^3n\sqrt{1+\frac{ex^2}{d}}}{6d^{\frac{9}{2}}e+6d^{\frac{7}{2}}e^2x^2}+\frac{bd^3n\log\left(\frac{ex^2}{d}\right)}{6d^{\frac{9}{2}}e+6d^{\frac{7}{2}}e^2x^2}-\frac{2bd^3n\log\left(\sqrt{1+\frac{ex^2}{d}}+1\right)}{6d^{\frac{9}{2}}e+6d^{\frac{7}{2}}e^2x^2}+\frac{bd^2nx^2\log\left(\frac{ex^2}{d}\right)}{6d^{\frac{9}{2}}+6d^{\frac{7}{2}}ex^2}-\frac{2bd^2nx^2\,\mathrm{lo}}{6d^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] -a/(3*e*(d + e*x**2)**(3/2)) + 2*b*d**3*n*sqrt(1 + e*x**2/d)/(6*d**(9/2)*e
+ 6*d**(7/2)*e**2*x**2) + b*d**3*n*log(e*x**2/d)/(6*d**(9/2)*e + 6*d**(7/2)
*e**2*x**2) - 2*b*d**3*n*log(sqrt(1 + e*x**2/d) + 1)/(6*d**(9/2)*e + 6*d**(
7/2)*e**2*x**2) + b*d**2*n*x**2*log(e*x**2/d)/(6*d**(9/2) + 6*d**(7/2)*e*x*
*2) - 2*b*d**2*n*x**2*log(sqrt(1 + e*x**2/d) + 1)/(6*d**(9/2) + 6*d**(7/2)*
e*x**2) - b*log(c*x**n)/(3*e*(d + e*x**2)**(3/2))
```

3.301 $\int \frac{a+b\log(cx^n)}{x\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=251

$$\frac{1}{3}\left(-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}+\frac{3}{d^2\sqrt{d+ex^2}}+\frac{1}{d\left(d+ex^2\right)^{3/2}}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bn\mathrm{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^2+d}}\right)}{2d^{5/2}}+\frac{bn\tanh^{-1}}{2d}$$

```
[Out] 4/3*b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(5/2)+1/2*b*n*arctanh((e*x^2+d)^
(1/2)/d^(1/2))^2/d^(5/2)-b*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))*ln(2*d^(1/2)/
(d^(1/2)-(e*x^2+d)^(1/2)))/d^(5/2)-1/2*b*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(
e*x^2+d)^(1/2)))/d^(5/2)+1/3*(a+b*ln(c*x^n))*(1/d/(e*x^2+d)^(3/2)-3*arctanh
((e*x^2+d)^(1/2)/d^(1/2))/d^(5/2)+3/d^2/(e*x^2+d)^(1/2))-1/3*b*n/d^2/(e*x^2
+d)^(1/2)
```

Rubi [A] time = 0.40, antiderivative size = 251, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 51, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{bn\mathrm{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{2d^{5/2}}+\frac{1}{3}\left(\frac{3}{d^2\sqrt{d+ex^2}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}+\frac{1}{d\left(d+ex^2\right)^{3/2}}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{}{3a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^2)^(5/2)),x]
```

```
[Out] -(b*n)/(3*d^2*Sqrt[d + e*x^2]) + (4*b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(
3*d^(5/2)) + (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(2*d^(5/2)) + ((1/(d*
(d + e*x^2)^(3/2)) + 3/(d^2*Sqrt[d + e*x^2]) - (3*ArcTanh[Sqrt[d + e*x^2]/S
qrt[d]])/d^(5/2))*(a + b*Log[c*x^n]))/3 - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt
[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/d^(5/2) - (b*n*PolyLog[2
, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(5/2))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\left(d+ex^2\right)^{5/2}}\,dx = \frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}\right)\left(a+b\log(cx^n)\right)-(bn)\int\Bigg(\frac{}{3dx}$$

$$=\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}\right)\left(a+b\log(cx^n)\right)+\frac{(bn)\int\frac{\tanh^{-}}{}}{d^{5}}$$

$$=\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}\right)\left(a+b\log(cx^n)\right)+\frac{(bn)\,\mathrm{Subst}}{}$$

$$=-\frac{bn}{3d^2\sqrt{d+ex^2}}+\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}\right)\left(a+b\log(cx\right.$$

$$=-\frac{bn}{3d^2\sqrt{d+ex^2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{5/2}}+\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{}{d}\right.$$

$$=-\frac{bn}{3d^2\sqrt{d+ex^2}}+\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{5/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{5/2}}+\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\right.$$

$$=-\frac{bn}{3d^2\sqrt{d+ex^2}}+\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{5/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{5/2}}+\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\right.$$

$$=-\frac{bn}{3d^2\sqrt{d+ex^2}}+\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{5/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{5/2}}+\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\right.$$

Mathematica [C] time = 0.45, size = 273, normalized size = 1.09

$$\frac{bn\sqrt{\frac{d}{ex^2}+1}\left(-3d^{5/2}\left(d+ex^2\right)^2\,{}_3F_2\left(\frac{5}{2},\frac{5}{2},\frac{5}{2};\frac{7}{2},\frac{7}{2};-\frac{d}{ex^2}\right)-75e^{5/2}x^5\log(x)\left(d+ex^2\right)^2\sinh^{-1}\left(\frac{\sqrt{d}}{\sqrt{e}\,x}\right)+25\sqrt{d}\,e^3x^6\right.}{75d^{5/2}e^2x^4\left(d+ex^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^2)^(5/2)),x]
```

```
[Out] (b*n*Sqrt[1 + d/(e*x^2)]*(-3*d^(5/2)*(d + e*x^2)^2*HypergeometricPFQ[{5/2,
5/2, 5/2}, {7/2, 7/2}, -(d/(e*x^2))] + 25*Sqrt[d]*e^3*Sqrt[1 + d/(e*x^2)]*x
```

```
^6*(4*d + 3*e*x^2)*Log[x] - 75*e^(5/2)*x^5*(d + e*x^2)^2*ArcSinh[Sqrt[d]/(S
qrt[e]*x)]*Log[x]))/(75*d^(5/2)*e^2*x^4*(d + e*x^2)^(5/2)) + ((4*d + 3*e*x^
2)*(a - b*n*Log[x] + b*Log[c*x^n]))/(3*d^2*(d + e*x^2)^(3/2)) + (Log[x]*(a
- b*n*Log[x] + b*Log[c*x^n]))/d^(5/2) - ((a - b*n*Log[x] + b*Log[c*x^n])*Lo
g[d + Sqrt[d]*Sqrt[d + e*x^2]])/d^(5/2)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,b\log(cx^n)+\sqrt{ex^2+d}\,a}{e^3x^7+3\,de^2x^5+3\,d^2ex^3+d^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e^3*x^7 + 3*d*
e^2*x^5 + 3*d^2*e*x^3 + d^3*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{\left(ex^2+d\right)^{\frac{5}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(5/2)*x), x)
```

maple [F] time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{b\ln(c\,x^n)+a}{\left(e\,x^2+d\right)^{\frac{5}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^2+d)^(5/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}a\left(\frac{3\,\text{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{d^{\frac{5}{2}}}-\frac{3}{\sqrt{ex^2+d}\,d^2}-\frac{1}{\left(ex^2+d\right)^{\frac{3}{2}}d}\right)+b\int \frac{\log(c)+\log(x^n)}{\left(e^2x^5+2\,dex^3+d^2x\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3*a*(3*arcsinh(d/(sqrt(d*e)*abs(x)))/d^(5/2) - 3/(sqrt(e*x^2 + d)*d^2) -
 1/((e*x^2 + d)^(3/2)*d)) + b*integrate((log(c) + log(x^n))/((e^2*x^5 + 2*d
*e*x^3 + d^2*x)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln(c\,x^n)}{x\left(e\,x^2+d\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^2)^(5/2)),x)
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x**2+d)**(5/2),x)
[Out] Timed out
```

3.302 $\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=337

$$\frac{5e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^{7/2}}-\frac{5e\left(a+b\log\left(cx^n\right)\right)}{2d^3\sqrt{d+ex^2}}-\frac{5e\left(a+b\log\left(cx^n\right)\right)}{6d^2\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{2dx^2\left(d+ex^2\right)^{3/2}}+\frac{5ben\text{Li}_2\left(1-\right.}{4d^7}$$

```
[Out] -31/12*b*e*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(7/2)-5/4*b*e*n*arctanh((e*
x^2+d)^(1/2)/d^(1/2))^2/d^(7/2)-5/6*e*(a+b*ln(c*x^n))/d^2/(e*x^2+d)^(3/2)+1
/2*(-a-b*ln(c*x^n))/d/x^2/(e*x^2+d)^(3/2)+5/2*e*arctanh((e*x^2+d)^(1/2)/d^(
1/2))*(a+b*ln(c*x^n))/d^(7/2)+5/2*b*e*n*arctanh((e*x^2+d)^(1/2)/d^(1/2))*ln
(2*d^(1/2)/(d^(1/2)-(e*x^2+d)^(1/2)))/d^(7/2)+5/4*b*e*n*polylog(2,1-2*d^(1/
2)/(d^(1/2)-(e*x^2+d)^(1/2)))/d^(7/2)+1/3*b*e*n/d^3/(e*x^2+d)^(1/2)-5/2*e*(
a+b*ln(c*x^n))/d^3/(e*x^2+d)^(1/2)-1/4*b*n*(e*x^2+d)^(1/2)/d^3/x^2
```

Rubi [A] time = 0.49, antiderivative size = 341, normalized size of antiderivative = 1.01, number of steps used = 13, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {266, 51, 63, 208, 2350, 1251, 897, 1259, 453, 5984, 5918, 2402, 2315}

$$\frac{5ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4d^{7/2}}-\frac{5\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2d^3x^2}+\frac{5\left(a+b\log\left(cx^n\right)\right)}{3d^2x^2\sqrt{d+ex^2}}+\frac{5e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\right.}{2d^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^(5/2)),x]
```

```
[Out] (b*e*n)/(3*d^3*Sqrt[d + e*x^2]) - (b*n*Sqrt[d + e*x^2])/(4*d^3*x^2) - (31*b
*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(12*d^(7/2)) - (5*b*e*n*ArcTanh[Sqrt
[d + e*x^2]/Sqrt[d]]^2)/(4*d^(7/2)) + (a + b*Log[c*x^n])/(3*d*x^2*(d + e*x^
2)^(3/2)) + (5*(a + b*Log[c*x^n]))/(3*d^2*x^2*Sqrt[d + e*x^2]) - (5*Sqrt[d
+ e*x^2]*(a + b*Log[c*x^n]))/(2*d^3*x^2) + (5*e*ArcTanh[Sqrt[d + e*x^2]/Sqr
t[d]]*(a + b*Log[c*x^n]))/(2*d^(7/2)) + (5*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sq
rt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(7/2)) + (5*b*e*n
*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*d^(7/2))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 453

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(a*e^n*(m + 1)), Int[(e*
x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[b*c
 - a*d, 0] && (IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (
LtQ[n, 0] && GtQ[m + n, -1])) &&  !ILtQ[p, -1]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 1259

```
Int[(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^
4)^(p_.), x_Symbol] :> Simp[((-d)^(m/2 - 1)*(c*d^2 - b*d*e + a*e^2)^p*x*(d
+ e*x^2)^(q + 1))/(2*e^(2*p + m/2)*(q + 1)), x] + Dist[(-d)^(m/2 - 1)/(2*e^
(2*p)*(q + 1)), Int[x^m*(d + e*x^2)^(q + 1)*ExpandToSum[Together[(1*(2*(-d)
^(-(m/2) + 1)*e^(2*p)*(q + 1)*(a + b*x^2 + c*x^4)^p - ((c*d^2 - b*d*e + a*e
^2)^p/(e^(m/2)*x^m))*(d + e*(2*q + 3)*x^2)))/(d + e*x^2)], x], x], x] /; Fr
eeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0] && ILtQ[q, -1]
 && ILtQ[m/2, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
```

```
IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)^{5/2}}\,dx = \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\log(cx^n)\right)}{3d^2x^2\sqrt{d+ex^2}} - \frac{5\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^3x^2} + \frac{5e\tanh^{-1}\left(\frac{\sqrt{d}}{}\right.}{}$$

$$= \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\log(cx^n)\right)}{3d^2x^2\sqrt{d+ex^2}} - \frac{5\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^3x^2} + \frac{5e\tanh^{-1}\left(\frac{\sqrt{d}}{}\right.}{}$$

$$= \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\log(cx^n)\right)}{3d^2x^2\sqrt{d+ex^2}} - \frac{5\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^3x^2} + \frac{5e\tanh^{-1}\left(\frac{\sqrt{d}}{}\right.}{}$$

$$= \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\log(cx^n)\right)}{3d^2x^2\sqrt{d+ex^2}} - \frac{5\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^3x^2} + \frac{5e\tanh^{-1}\left(\frac{\sqrt{d}}{}\right.}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^3x^2} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{7/2}} + \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\log(cx^n)\right)}{3d^2x^2\sqrt{d+ex^2}} - \frac{5}{}$$

$$= \frac{ben}{3d^3\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{4d^3x^2} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{7/2}} + \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\right.}{3d^2x^2}$$

$$= \frac{ben}{3d^3\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{4d^3x^2} - \frac{31ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{12d^{7/2}} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{7/2}} + \frac{a}{3d}$$

$$= \frac{ben}{3d^3\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{4d^3x^2} - \frac{31ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{12d^{7/2}} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{7/2}} + \frac{a}{3d}$$

Mathematica [C] time = 0.29, size = 227, normalized size = 0.67

$$\frac{bn\sqrt{\frac{d}{ex^2}+1}\left(5\,{}_3F_2\left(\frac{7}{2},\frac{7}{2},\frac{7}{2};\frac{9}{2},\frac{9}{2};-\frac{d}{ex^2}\right)-7(2\log(x)+1)\,{}_2F_1\left(\frac{5}{2},\frac{7}{2};\frac{9}{2};-\frac{d}{ex^2}\right)\right)}{98e^2x^6\sqrt{d+ex^2}} - \frac{5e\log(x)\left(a+b\log(cx^n)-bn\log\right.}{2d^{7/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^(5/2)),x]
```

```
[Out] (b*n*Sqrt[1 + d/(e*x^2)]*(5*HypergeometricPFQ[{7/2, 7/2, 7/2}, {9/2, 9/2},
-(d/(e*x^2))] - 7*Hypergeometric2F1[5/2, 7/2, 9/2, -(d/(e*x^2))]*(1 + 2*Log
[x])))/(98*e^2*x^6*Sqrt[d + e*x^2]) - ((3*d^2 + 20*d*e*x^2 + 15*e^2*x^4)*(a
 - b*n*Log[x] + b*Log[c*x^n]))/(6*d^3*x^2*(d + e*x^2)^(3/2)) - (5*e*Log[x]*
```

```
(a - b*n*Log[x] + b*Log[c*x^n]))/(2*d^(7/2)) + (5*e*(a - b*n*Log[x] + b*Log
[c*x^n])*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(2*d^(7/2))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,b\log\left(cx^n\right)+\sqrt{ex^2+d}\,a}{e^3x^9+3\,de^2x^7+3\,d^2ex^5+d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e^3*x^9 + 3*d*
e^2*x^7 + 3*d^2*e*x^5 + d^3*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^{\frac{5}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(5/2)*x^3), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right)+a}{\left(e\,x^2+d\right)^{\frac{5}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(e*x^2+d)^(5/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^3/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{6}a\left(\frac{15\,e\,\text{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{d^{\frac{7}{2}}}-\frac{15\,e}{\sqrt{ex^2+d}\,d^3}-\frac{5\,e}{\left(ex^2+d\right)^{\frac{3}{2}}d^2}-\frac{3}{\left(ex^2+d\right)^{\frac{3}{2}}dx^2}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{\left(e^2x^7+2\,dex^5+d^2x^3\right)\sqrt{ex^2+d}}\,d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/6*a*(15*e*arcsinh(d/(sqrt(d*e)*abs(x)))/d^(7/2) - 15*e/(sqrt(e*x^2 + d)*d
^3) - 5*e/((e*x^2 + d)^(3/2)*d^2) - 3/((e*x^2 + d)^(3/2)*d*x^2)) + b*integr
ate((log(c) + log(x^n))/((e^2*x^7 + 2*d*e*x^5 + d^2*x^3)*sqrt(e*x^2 + d)),
x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,{\left(e\,x^2+d\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)^(5/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.303 $\int \frac{x^6\left(a+b\log(cx^n)\right)}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=443

$$-\frac{5d^{3/2}\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{7/2}\sqrt{d+ex^2}}+\frac{5x\sqrt{d+ex^2}\,\left(a+b\log\left(cx^n\right)\right)}{2e^3}-\frac{5x^3\left(a+b\log\left(cx^n\right)\right)}{3e^2\sqrt{d+ex^2}}-\frac{x^5\left(a+b\log\right.}{3e\left(d+e\right.}$$

```
[Out] -1/3*x^5*(a+b*ln(c*x^n))/e/(e*x^2+d)^(3/2)+5/6*b*d*n*x/e^3/(e*x^2+d)^(1/2)+
1/2*b*n*x^3/e^2/(e*x^2+d)^(1/2)-5/3*x^3*(a+b*ln(c*x^n))/e^2/(e*x^2+d)^(1/2)
-3/4*b*n*x*(e*x^2+d)^(1/2)/e^3+5/2*x*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/e^3-31
/12*b*d^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*(1+e*x^2/d)^(1/2)/e^(7/2)/(e*x^2
+d)^(1/2)-5/4*b*d^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))^2*(1+e*x^2/d)^(1/2)/e^
(7/2)/(e*x^2+d)^(1/2)-5*b*d^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*arctanh((x*e
^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*(1+e*x^2/d)^(1/2)/e^(7/2)/(e*x^2+d)^(1
/2)+5/2*b*d^(3/2)*n*arcsinh(x*e^(1/2)/d^(1/2))*ln(1+(x*e^(1/2)/d^(1/2)+(1+e
*x^2/d)^(1/2))^2)*(1+e*x^2/d)^(1/2)/e^(7/2)/(e*x^2+d)^(1/2)-5/2*d^(3/2)*arc
sinh(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n))*(1+e*x^2/d)^(1/2)/e^(7/2)/(e*x^2+d)
^(1/2)+5/4*b*d^(3/2)*n*polylog(2,(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*(
1+e*x^2/d)^(1/2)/e^(7/2)/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.54, antiderivative size = 443, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {2341, 288, 321, 215, 2350, 21, 1157, 388, 5659, 3716, 2190, 2279, 2391}

$$\frac{5bd^{3/2}n\sqrt{\frac{ex^2}{d}+1}\,\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4e^{7/2}\sqrt{d+ex^2}}-\frac{5d^{3/2}\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{7/2}\sqrt{d+ex^2}}-\frac{5x^3\left(a+b\log\left(cx^n\right)\right)}{3e^2\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^6*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*d*n*x)/(3*e^3*Sqrt[d + e*x^2]) - (b*n*x*Sqrt[d + e*x^2])/(4*e^3) - (31*b
*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(12*e^(7/2)*Sq
rt[d + e*x^2]) - (5*b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqr
t[d]]^2)/(4*e^(7/2)*Sqrt[d + e*x^2]) + (5*b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2
*e^(7/2)*Sqrt[d + e*x^2]) - (x^5*(a + b*Log[c*x^n]))/(3*e*(d + e*x^2)^(3/2)
) - (5*x^3*(a + b*Log[c*x^n]))/(3*e^2*Sqrt[d + e*x^2]) + (5*x*Sqrt[d + e*x^
2]*(a + b*Log[c*x^n]))/(2*e^3) - (5*d^(3/2)*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sq
rt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*e^(7/2)*Sqrt[d + e*x^2]) + (5*b*d^
(3/2)*n*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])
/(4*e^(7/2)*Sqrt[d + e*x^2])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 1157

```
Int[((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 + c*x^4)^p, d + e*x^2
, x], R = Coeff[PolynomialRemainder[(a + b*x^2 + c*x^4)^p, d + e*x^2, x], x
, 0]}, -Simp[(R*x*(d + e*x^2)^(q + 1))/(2*d*(q + 1)), x] + Dist[1/(2*d*(q +
 1)), Int[(d + e*x^2)^(q + 1)*ExpandToSum[2*d*(q + 1)*Qx + R*(2*q + 3), x],
 x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 -
 b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
```

```
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int \frac{x^6 \left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{5/2}}\,dx = \frac{\sqrt{1+\frac{ex^2}{d}}\int \frac{x^6\left(a+b\log(cx^n)\right)}{\left(1+\frac{ex^2}{d}\right)^{5/2}}\,dx}{d^2\sqrt{d+ex^2}}$$

$$= -\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{3e\left(d+ex^2\right)^{3/2}} - \frac{5x^3\left(a+b\log\left(cx^n\right)\right)}{3e^2\sqrt{d+ex^2}} + \frac{5x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e^3} - \frac{5}{}$$

$$= -\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{3e\left(d+ex^2\right)^{3/2}} - \frac{5x^3\left(a+b\log\left(cx^n\right)\right)}{3e^2\sqrt{d+ex^2}} + \frac{5x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e^3} - \frac{5}{}$$

$$= -\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{3e\left(d+ex^2\right)^{3/2}} - \frac{5x^3\left(a+b\log\left(cx^n\right)\right)}{3e^2\sqrt{d+ex^2}} + \frac{5x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e^3} - \frac{5}{}$$

$$= \frac{bdnx}{3e^3\sqrt{d+ex^2}} - \frac{5bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{7/2}\sqrt{d+ex^2}} - \frac{x^5\left(a+b\log\left(cx^n\right)\right)}{3e\left(d+ex^2\right)^{3/2}} - \frac{5x^3\left(a+\right.}{3e^2\sqrt{}}$$

$$= \frac{bdnx}{3e^3\sqrt{d+ex^2}} - \frac{bnx\sqrt{d+ex^2}}{4e^3} - \frac{5bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{7/2}\sqrt{d+ex^2}} + \frac{5bd^{3/2}n\sqrt{1+}}{}$$

$$= \frac{bdnx}{3e^3\sqrt{d+ex^2}} - \frac{bnx\sqrt{d+ex^2}}{4e^3} - \frac{31bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{12e^{7/2}\sqrt{d+ex^2}} - \frac{5bd^{3/2}n\sqrt{1+}}{4e^{7/2}}$$

$$= \frac{bdnx}{3e^3\sqrt{d+ex^2}} - \frac{bnx\sqrt{d+ex^2}}{4e^3} - \frac{31bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{12e^{7/2}\sqrt{d+ex^2}} - \frac{5bd^{3/2}n\sqrt{1+}}{4e^{7/2}}$$

Mathematica [C] time = 0.28, size = 199, normalized size = 0.45

$$\frac{bnx^7\sqrt{\frac{ex^2}{d}+1}\left(5\,{}_3F_2\left(\frac{7}{2},\frac{7}{2},\frac{7}{2};\frac{9}{2},\frac{9}{2};-\frac{ex^2}{d}\right)+7(2\log(x)-1)\,{}_2F_1\left(\frac{5}{2},\frac{7}{2};\frac{9}{2};-\frac{ex^2}{d}\right)\right)}{98d^2\sqrt{d+ex^2}} + \frac{x\left(15d^2+20dex^2+3e^2x^4\right)\left(a+\right.}{6e^3\left(d+ex\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^6*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*n*x^7*Sqrt[1 + (e*x^2)/d]*(5*HypergeometricPFQ[{7/2, 7/2, 7/2}, {9/2, 9/
2}, -((e*x^2)/d)] + 7*Hypergeometric2F1[5/2, 7/2, 9/2, -((e*x^2)/d)]*(-1 +
2*Log[x])))/(98*d^2*Sqrt[d + e*x^2]) + (x*(15*d^2 + 20*d*e*x^2 + 3*e^2*x^4)
*(a - b*n*Log[x] + b*Log[c*x^n]))/(6*e^3*(d + e*x^2)^(3/2)) - (5*d*(a - b*n
*Log[x] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(2*e^(7/2))
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,bx^6\log\left(cx^n\right)+\sqrt{ex^2+d}\,ax^6}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*x^6*log(c*x^n) + sqrt(e*x^2 + d)*a*x^6)/(e^3*x^
6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)x^{6}}{\left(ex^{2}+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^6/(e*x^2 + d)^(5/2), x)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^{n}\right)+a\right)x^{6}}{\left(e\,x^{2}+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^6*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^6*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{6}\left(\frac{3\,x^{5}}{\left(ex^{2}+d\right)^{\frac{3}{2}}e}+\frac{5\,dx\left(\frac{3\,x^{2}}{\left(ex^{2}+d\right)^{\frac{3}{2}}e}+\frac{2\,d}{\left(ex^{2}+d\right)^{\frac{3}{2}}e^{2}}\right)}{e}+\frac{5\,dx}{\sqrt{ex^{2}+d}\,e^{3}}-\frac{15\,d\,\mathrm{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{e^{\frac{7}{2}}}\right)a+b\int \frac{x^{6}\log(c)+x^{6}\log(\ldots}{\left(e^{2}x^{4}+2\,dex^{2}+d^{2}\right)\sqrt{e\ldots}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/6*(3*x^5/((e*x^2 + d)^(3/2)*e) + 5*d*x*(3*x^2/((e*x^2 + d)^(3/2)*e) + 2*d
/((e*x^2 + d)^(3/2)*e^2))/e + 5*d*x/(sqrt(e*x^2 + d)*e^3) - 15*d*arcsinh(e*
x/sqrt(d*e))/e^(7/2))*a + b*integrate((x^6*log(c) + x^6*log(x^n))/((e^2*x^4
 + 2*d*e*x^2 + d^2)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^{6}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{{\left(e\,x^{2}+d\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^6*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2),x)
```

```
[Out] int((x^6*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**6*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.304 $\int \frac{x^4(a+b\log(cx^n))}{(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=383

$$\frac{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{5/2}\sqrt{d+ex^2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}-\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e\left(d+ex^2\right)^{3/2}}-\frac{b\sqrt{d}\,n\sqrt{\frac{ex^2}{d}+1}\,\mathrm{Li}_2\left(e^{2\sinh\cdots}\right.}{2e^{5/2}\sqrt{d+ex^2}}$$

```
[Out] -1/3*x^3*(a+b*ln(c*x^n))/e/(e*x^2+d)^(3/2)-1/3*b*n*x/e^2/(e*x^2+d)^(1/2)-x*
(a+b*ln(c*x^n))/e^2/(e*x^2+d)^(1/2)+4/3*b*n*arcsinh(x*e^(1/2)/d^(1/2))*d^(1
/2)*(1+e*x^2/d)^(1/2)/e^(5/2)/(e*x^2+d)^(1/2)+1/2*b*n*arcsinh(x*e^(1/2)/d^(
1/2))^2*d^(1/2)*(1+e*x^2/d)^(1/2)/e^(5/2)/(e*x^2+d)^(1/2)-b*n*arcsinh(x*e^(
1/2)/d^(1/2))*ln(1-(x*e^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*d^(1/2)*(1+e*x^
2/d)^(1/2)/e^(5/2)/(e*x^2+d)^(1/2)+arcsinh(x*e^(1/2)/d^(1/2))*(a+b*ln(c*x^n
))*d^(1/2)*(1+e*x^2/d)^(1/2)/e^(5/2)/(e*x^2+d)^(1/2)-1/2*b*n*polylog(2,(x*e
^(1/2)/d^(1/2)+(1+e*x^2/d)^(1/2))^2)*d^(1/2)*(1+e*x^2/d)^(1/2)/e^(5/2)/(e*x
^2+d)^(1/2)
```

Rubi [A] time = 0.56, antiderivative size = 383, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {2341, 288, 215, 2350, 21, 385, 5659, 3716, 2190, 2279, 2391}

$$-\frac{b\sqrt{d}\,n\sqrt{\frac{ex^2}{d}+1}\,\mathrm{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2e^{5/2}\sqrt{d+ex^2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{5/2}\sqrt{d+ex^2}}-\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] -(b*n*x)/(3*e^2*Sqrt[d + e*x^2]) + (4*b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSi
nh[(Sqrt[e]*x)/Sqrt[d]])/(3*e^(5/2)*Sqrt[d + e*x^2]) + (b*Sqrt[d]*n*Sqrt[1
+ (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(2*e^(5/2)*Sqrt[d + e*x^2]) -
(b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*
ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(e^(5/2)*Sqrt[d + e*x^2]) - (x^3*(a + b*Log
[c*x^n]))/(3*e*(d + e*x^2)^(3/2)) - (x*(a + b*Log[c*x^n]))/(e^2*Sqrt[d + e*
x^2]) + (Sqrt[d]*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Lo
g[c*x^n]))/(e^(5/2)*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*Pol
yLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*e^(5/2)*Sqrt[d + e*x^2])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
```

```
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> -S
imp[((b*c - a*d)*x*(a + b*x^n)^(p + 1))/(a*b*n*(p + 1)), x] - Dist[(a*d - b
*c*(n*(p + 1) + 1))/(a*b*n*(p + 1)), Int[(a + b*x^n)^(p + 1), x], x] /; Fre
eQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d, 0] && (LtQ[p, -1] || ILtQ[1/n +
 p, 0])
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
```

```
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rubi steps

$$\int \frac{x^4 \left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{5/2}}\,dx = \frac{\sqrt{1+\frac{ex^2}{d}}\int \frac{x^4\left(a+b\log\left(cx^n\right)\right)}{\left(1+\frac{ex^2}{d}\right)^{5/2}}\,dx}{d^2\sqrt{d+ex^2}}$$

$$= -\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e\left(d+ex^2\right)^{3/2}} - \frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(c\right.\right.}{e^{5/2}\sqrt{d+ex^2}}$$

$$= -\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e\left(d+ex^2\right)^{3/2}} - \frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(c\right.\right.}{e^{5/2}\sqrt{d+ex^2}}$$

$$= -\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e\left(d+ex^2\right)^{3/2}} - \frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(c\right.\right.}{e^{5/2}\sqrt{d+ex^2}}$$

$$= -\frac{bnx}{3e^2\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{5/2}\sqrt{d+ex^2}} - \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3e\left(d+ex^2\right)^{3/2}} - \frac{x\left(a+b\log\right.}{e^2\sqrt{d+}}$$

$$= -\frac{bnx}{3e^2\sqrt{d+ex^2}} + \frac{4b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3e^{5/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{5/2}\sqrt{d+ex^2}} -$$

$$= -\frac{bnx}{3e^2\sqrt{d+ex^2}} + \frac{4b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3e^{5/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{5/2}\sqrt{d+ex^2}} -$$

$$= -\frac{bnx}{3e^2\sqrt{d+ex^2}} + \frac{4b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3e^{5/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{5/2}\sqrt{d+ex^2}} -$$

Mathematica [C] time = 0.87, size = 244, normalized size = 0.64

$$-\frac{bn\sqrt{\frac{ex^2}{d}+1}\left(3e^{5/2}x^5\left(d+ex^2\right)^2 {}_3F_2\left(\frac{5}{2},\frac{5}{2},\frac{5}{2};\frac{7}{2},\frac{7}{2};-\frac{ex^2}{d}\right) - 75d^{5/2}\log(x)\left(d+ex^2\right)^2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right) + 25d^3\sqrt{e}x\log(\right.}{75d^2e^{5/2}\left(d+ex^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] -1/75*(b*n*Sqrt[1 + (e*x^2)/d]*(3*e^(5/2)*x^5*(d + e*x^2)^2*HypergeometricP
FQ[{5/2, 5/2, 5/2}, {7/2, 7/2}, -((e*x^2)/d)] + 25*d^3*Sqrt[e]*x*(3*d + 4*e
```

```
*x^2)*Sqrt[1 + (e*x^2)/d]*Log[x] - 75*d^(5/2)*(d + e*x^2)^2*ArcSinh[(Sqrt[e
]*x)/Sqrt[d]]*Log[x]))/(d^2*e^(5/2)*(d + e*x^2)^(5/2)) - (x*(3*d + 4*e*x^2)
*(a - b*n*Log[x] + b*Log[c*x^n]))/(3*e^2*(d + e*x^2)^(3/2)) + ((a - b*n*Log
[x] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/e^(5/2)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,bx^4\log\left(cx^n\right)+\sqrt{ex^2+d}\,ax^4}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*x^4*log(c*x^n) + sqrt(e*x^2 + d)*a*x^4)/(e^3*x^
6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^4}{\left(ex^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^4/(e*x^2 + d)^(5/2), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)x^4}{\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^4*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}\left(x\left(\frac{3\,x^2}{\left(ex^2+d\right)^{\frac{3}{2}}e}+\frac{2\,d}{\left(ex^2+d\right)^{\frac{3}{2}}e^2}\right)+\frac{x}{\sqrt{ex^2+d}\,e^2}-\frac{3\,\operatorname{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{e^{\frac{5}{2}}}\right)a+b\int \frac{x^4\log(c)+x^4\log\left(x^n\right)}{\left(e^2x^4+2\,dex^2+d^2\right)\sqrt{ex^2+d}}\,d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3*(x*(3*x^2/((e*x^2 + d)^(3/2)*e) + 2*d/((e*x^2 + d)^(3/2)*e^2)) + x/(sq
rt(e*x^2 + d)*e^2) - 3*arcsinh(e*x/sqrt(d*e))/e^(5/2))*a + b*integrate((x^4
*log(c) + x^4*log(x^n))/((e^2*x^4 + 2*d*e*x^2 + d^2)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(e\,x^2+d\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2),x)
[Out] int((x^4*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
[Out] Timed out
```

3.305 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=89

$$\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{3de^{3/2}}+\frac{bnx}{3de\sqrt{d+ex^2}}$$

```
[Out] -1/3*b*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/d/e^(3/2)+1/3*x^3*(a+b*ln(c*x^n
))/d/(e*x^2+d)^(3/2)+1/3*b*n*x/d/e/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.11, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2335, 288, 217, 206}

$$\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{3de^{3/2}}+\frac{bnx}{3de\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*n*x)/(3*d*e*Sqrt[d + e*x^2]) - (b*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]]
)/(3*d*e^(3/2)) + (x^3*(a + b*Log[c*x^n]))/(3*d*(d + e*x^2)^(3/2))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^{5/2}}\,dx = \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}} - \frac{(bn)\int \frac{x^2}{\left(d+ex^2\right)^{3/2}}\,dx}{3d}$$

$$= \frac{bnx}{3de\sqrt{d+ex^2}} + \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}} - \frac{(bn)\int \frac{1}{\sqrt{d+ex^2}}\,dx}{3de}$$

$$= \frac{bnx}{3de\sqrt{d+ex^2}} + \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}} - \frac{(bn)\,\text{Subst}\left(\int \frac{1}{1-ex^2}\,dx, x, \frac{x}{\sqrt{d+ex^2}}\right)}{3de}$$

$$= \frac{bnx}{3de\sqrt{d+ex^2}} - \frac{bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3de^{3/2}} + \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}}$$

Mathematica [A] time = 0.15, size = 101, normalized size = 1.13

$$\frac{\sqrt{e}x\left(aex^2+bn\left(d+ex^2\right)\right)+be^{3/2}x^3\log\left(cx^n\right)-bn\left(d+ex^2\right)^{3/2}\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{3de^{3/2}\left(d+ex^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (Sqrt[e]*x*(a*e*x^2 + b*n*(d + e*x^2)) + b*e^(3/2)*x^3*Log[c*x^n] - b*n*(d
+ e*x^2)^(3/2)*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(3*d*e^(3/2)*(d + e*x^2)
^(3/2))
```

fricas [A] time = 0.47, size = 277, normalized size = 3.11

$$\left[\frac{\left(be^2nx^4+2\,bdenx^2+bd^2n\right)\sqrt{e}\,\log\left(-2\,ex^2+2\,\sqrt{ex^2+d}\,\sqrt{e}x-d\right)+2\left(be^2nx^3\log(x)+be^2x^3\log(c)+bdenx+\right.}{6\left(de^4x^4+2\,d^2e^3x^2+d^3e^2\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/6*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(e)*log(-2*e*x^2 + 2*sqrt
(e*x^2 + d)*sqrt(e)*x - d) + 2*(b*e^2*n*x^3*log(x) + b*e^2*x^3*log(c) + b*d
*e*n*x + (b*e^2*n + a*e^2)*x^3)*sqrt(e*x^2 + d))/(d*e^4*x^4 + 2*d^2*e^3*x^2
 + d^3*e^2), 1/3*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(-e)*arctan(s
qrt(-e)*x/sqrt(e*x^2 + d)) + (b*e^2*n*x^3*log(x) + b*e^2*x^3*log(c) + b*d*e
*n*x + (b*e^2*n + a*e^2)*x^3)*sqrt(e*x^2 + d))/(d*e^4*x^4 + 2*d^2*e^3*x^2 +
 d^3*e^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^2}{\left(ex^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^2 + d)^(5/2), x)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{(b \ln (c x^n) + a) x^2}{(e x^2 + d)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
[Out] int(x^2*(b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3} a \left(\frac{x}{(ex^2 + d)^{\frac{3}{2}} e} - \frac{x}{\sqrt{ex^2 + d} de} \right) + b \int \frac{x^2 \log(c) + x^2 \log(x^n)}{(e^2 x^4 + 2 dex^2 + d^2)\sqrt{ex^2 + d}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
[Out] -1/3*a*(x/((e*x^2 + d)^(3/2)*e) - x/(sqrt(e*x^2 + d)*d*e)) + b*integrate((x
^2*log(c) + x^2*log(x^n))/((e^2*x^4 + 2*d*e*x^2 + d^2)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2 (a + b \ln (c x^n))}{(e x^2 + d)^{5/2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2),x)
[Out] int((x^2*(a + b*log(c*x^n)))/(d + e*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
[Out] Timed out
```

3.306 $\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=113

$$\frac{2x\left(a+b\log\left(cx^n\right)\right)}{3d^2\sqrt{d+ex^2}}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}}-\frac{bnx}{3d^2\sqrt{d+ex^2}}-\frac{2bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}$$

```
[Out] 1/3*x*(a+b*ln(c*x^n))/d/(e*x^2+d)^(3/2)-2/3*b*n*arctanh(x*e^(1/2)/(e*x^2+d)
^(1/2))/d^2/e^(1/2)-1/3*b*n*x/d^2/(e*x^2+d)^(1/2)+2/3*x*(a+b*ln(c*x^n))/d^2
/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.07, antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {2323, 2314, 217, 206, 191}

$$\frac{2x\left(a+b\log\left(cx^n\right)\right)}{3d^2\sqrt{d+ex^2}}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}}-\frac{bnx}{3d^2\sqrt{d+ex^2}}-\frac{2bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^2)^(5/2),x]
```

```
[Out] -(b*n*x)/(3*d^2*Sqrt[d + e*x^2]) - (2*b*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^
2]])/(3*d^2*Sqrt[e]) + (x*(a + b*Log[c*x^n]))/(3*d*(d + e*x^2)^(3/2)) + (2*
x*(a + b*Log[c*x^n]))/(3*d^2*Sqrt[d + e*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex^2)^{5/2}}\,dx = \frac{x\left(a+b\log(cx^n)\right)}{3d\left(d+ex^2\right)^{3/2}} + \frac{2\int \frac{a+b\log(cx^n)}{(d+ex^2)^{3/2}}\,dx}{3d} - \frac{(bn)\int \frac{1}{(d+ex^2)^{3/2}}\,dx}{3d}$$

$$= -\frac{bnx}{3d^2\sqrt{d+ex^2}} + \frac{x\left(a+b\log(cx^n)\right)}{3d\left(d+ex^2\right)^{3/2}} + \frac{2x\left(a+b\log(cx^n)\right)}{3d^2\sqrt{d+ex^2}} - \frac{(2bn)\int \frac{1}{\sqrt{d+ex^2}}\,dx}{3d^2}$$

$$= -\frac{bnx}{3d^2\sqrt{d+ex^2}} + \frac{x\left(a+b\log(cx^n)\right)}{3d\left(d+ex^2\right)^{3/2}} + \frac{2x\left(a+b\log(cx^n)\right)}{3d^2\sqrt{d+ex^2}} - \frac{(2bn)\,\mathrm{Subst}\left(\int \frac{1}{1-ex^2}\,dx,\right.}{3d^2}$$

$$= -\frac{bnx}{3d^2\sqrt{d+ex^2}} - \frac{2bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}} + \frac{x\left(a+b\log(cx^n)\right)}{3d\left(d+ex^2\right)^{3/2}} + \frac{2x\left(a+b\log(cx^n)\right)}{3d^2\sqrt{d+ex^2}}$$

Mathematica [A] time = 0.14, size = 116, normalized size = 1.03

$$\frac{\sqrt{e}x\left(a\left(3d+2ex^2\right)-bn\left(d+ex^2\right)\right)+b\sqrt{e}x\left(3d+2ex^2\right)\log(cx^n)-2bn\left(d+ex^2\right)^{3/2}\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{3d^2\sqrt{e}\left(d+ex^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^2)^(5/2),x]
```

```
[Out] (Sqrt[e]*x*(-(b*n*(d + e*x^2)) + a*(3*d + 2*e*x^2)) + b*Sqrt[e]*x*(3*d + 2*
e*x^2)*Log[c*x^n] - 2*b*n*(d + e*x^2)^(3/2)*Log[e*x + Sqrt[e]*Sqrt[d + e*x^
2]])/(3*d^2*Sqrt[e]*(d + e*x^2)^(3/2))
```

fricas [A] time = 0.47, size = 337, normalized size = 2.98

$$\left[\frac{\left(be^2nx^4+2\,bdenx^2+bd^2n\right)\sqrt{e}\,\log\left(-2\,ex^2+2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)-\left(\left(be^2n-2\,ae^2\right)x^3+(bden-3\,ade)x-(2\right.}{3\left(d^2e^3x^4+2\,d^3e^2x^2+d^4e\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/3*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(e)*log(-2*e*x^2 + 2*sqrt
(e*x^2 + d)*sqrt(e)*x - d) - ((b*e^2*n - 2*a*e^2)*x^3 + (b*d*e*n - 3*a*d*e)
*x - (2*b*e^2*x^3 + 3*b*d*e*x)*log(c) - (2*b*e^2*n*x^3 + 3*b*d*e*n*x)*log(x
))*sqrt(e*x^2 + d))/(d^2*e^3*x^4 + 2*d^3*e^2*x^2 + d^4*e), 1/3*(2*(b*e^2*n*
x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d))
- ((b*e^2*n - 2*a*e^2)*x^3 + (b*d*e*n - 3*a*d*e)*x - (2*b*e^2*x^3 + 3*b*d*e
*x)*log(c) - (2*b*e^2*n*x^3 + 3*b*d*e*n*x)*log(x))*sqrt(e*x^2 + d))/(d^2*e^
3*x^4 + 2*d^3*e^2*x^2 + d^4*e)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{(ex^2+d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)/(e*x^2 + d)^(5/2), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{b\ln(c\,x^n)+a}{(e\,x^2+d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
[Out] int((b*ln(c*x^n)+a)/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\,a\left(\frac{2\,x}{\sqrt{ex^2+d}\,d^2}+\frac{x}{(ex^2+d)^{\frac{3}{2}}d}\right)+b\int\frac{\log(c)+\log(x^n)}{(e^2x^4+2\,dex^2+d^2)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
[Out] 1/3*a*(2*x/(sqrt(e*x^2 + d)*d^2) + x/((e*x^2 + d)^(3/2)*d)) + b*integrate((
log(c) + log(x^n))/((e^2*x^4 + 2*d*e*x^2 + d^2)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln(c\,x^n)}{(e\,x^2+d)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x^2)^(5/2),x)
[Out] int((a + b*log(c*x^n))/(d + e*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
[Out] Timed out
```

3.307 $\int \frac{a+b\log(cx^n)}{x^2\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=166

$$-\frac{8ex\left(a+b\log\left(cx^n\right)\right)}{3d^3\sqrt{d+ex^2}}-\frac{4ex\left(a+b\log\left(cx^n\right)\right)}{3d^2\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{dx\left(d+ex^2\right)^{3/2}}-\frac{2benx}{3d^3\sqrt{d+ex^2}}+\frac{8b\sqrt{e}\,n\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{3d^3}-\frac{bn}{d^2x\sqrt{d+ex^2}}$$

```
[Out] (-a-b*ln(c*x^n))/d/x/(e*x^2+d)^(3/2)-4/3*e*x*(a+b*ln(c*x^n))/d^2/(e*x^2+d)^
(3/2)+8/3*b*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))*e^(1/2)/d^3-b*n/d^2/x/(e*x
^2+d)^(1/2)-2/3*b*e*n*x/d^3/(e*x^2+d)^(1/2)-8/3*e*x*(a+b*ln(c*x^n))/d^3/(e*
x^2+d)^(1/2)
```

Rubi [A] time = 0.17, antiderivative size = 166, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {271, 192, 191, 2350, 12, 1265, 385, 217, 206}

$$-\frac{8ex\left(a+b\log\left(cx^n\right)\right)}{3d^3\sqrt{d+ex^2}}-\frac{4ex\left(a+b\log\left(cx^n\right)\right)}{3d^2\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{dx\left(d+ex^2\right)^{3/2}}-\frac{2benx}{3d^3\sqrt{d+ex^2}}-\frac{bn}{d^2x\sqrt{d+ex^2}}+\frac{8b\sqrt{e}\,n\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^(5/2)),x]
```

```
[Out] -((b*n)/(d^2*x*Sqrt[d + e*x^2])) - (2*b*e*n*x)/(3*d^3*Sqrt[d + e*x^2]) + (8
*b*Sqrt[e]*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d^3) - (a + b*Log[c*x
^n])/(d*x*(d + e*x^2)^(3/2)) - (4*e*x*(a + b*Log[c*x^n]))/(3*d^2*(d + e*x^2
)^(3/2)) - (8*e*x*(a + b*Log[c*x^n]))/(3*d^3*Sqrt[d + e*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> -S
imp[((b*c - a*d)*x*(a + b*x^n)^(p + 1))/(a*b*n*(p + 1)), x] - Dist[(a*d - b
*c*(n*(p + 1) + 1))/(a*b*n*(p + 1)), Int[(a + b*x^n)^(p + 1), x], x] /; Fre
eQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d, 0] && (LtQ[p, -1] || ILtQ[1/n +
 p, 0])
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2\left(d+ex^2\right)^{5/2}}\,dx = -\frac{a+b\log(cx^n)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\log(cx^n)\right)}{3d^2\left(d+ex^2\right)^{3/2}} - \frac{8ex\left(a+b\log(cx^n)\right)}{3d^3\sqrt{d+ex^2}} - (bn)\int \frac{-3d^2-12dex^2}{3d^3x^2\left(d+e\right.}$$

$$= -\frac{a+b\log(cx^n)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\log(cx^n)\right)}{3d^2\left(d+ex^2\right)^{3/2}} - \frac{8ex\left(a+b\log(cx^n)\right)}{3d^3\sqrt{d+ex^2}} - \frac{(bn)\int \frac{-3d^2-12dex^2-8e^2x^4}{x^2\left(d+ex^2\right)^{3/2}}}{3d^3}$$

$$= -\frac{bn}{d^2x\sqrt{d+ex^2}} - \frac{a+b\log(cx^n)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\log(cx^n)\right)}{3d^2\left(d+ex^2\right)^{3/2}} - \frac{8ex\left(a+b\log(cx^n)\right)}{3d^3\sqrt{d+ex^2}} + \frac{(bn)\int}{}$$

$$= -\frac{bn}{d^2x\sqrt{d+ex^2}} - \frac{2benx}{3d^3\sqrt{d+ex^2}} - \frac{a+b\log(cx^n)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\log(cx^n)\right)}{3d^2\left(d+ex^2\right)^{3/2}} - \frac{8ex\left(a+b\log\right.}{3d^3\sqrt{d+e}}$$

$$= -\frac{bn}{d^2x\sqrt{d+ex^2}} - \frac{2benx}{3d^3\sqrt{d+ex^2}} - \frac{a+b\log(cx^n)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\log(cx^n)\right)}{3d^2\left(d+ex^2\right)^{3/2}} - \frac{8ex\left(a+b\log\right.}{3d^3\sqrt{d+e}}$$

$$= -\frac{bn}{d^2x\sqrt{d+ex^2}} - \frac{2benx}{3d^3\sqrt{d+ex^2}} + \frac{8b\sqrt{e}\,n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^3} - \frac{a+b\log(cx^n)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\right.}{3d^2\left(d-\right.}$$

Mathematica [A] time = 0.19, size = 144, normalized size = 0.87

$$\frac{-3ad^2-12adex^2-8ae^2x^4-b\left(3d^2+12dex^2+8e^2x^4\right)\log\left(cx^n\right)-3bd^2n-5bdenx^2+8b\sqrt{e}\,nx\left(d+ex^2\right)^{3/2}\log}{3d^3x\left(d+ex^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^(5/2)),x]
```

```
[Out] (-3*a*d^2 - 3*b*d^2*n - 12*a*d*e*x^2 - 5*b*d*e*n*x^2 - 8*a*e^2*x^4 - 2*b*e^
2*n*x^4 - b*(3*d^2 + 12*d*e*x^2 + 8*e^2*x^4)*Log[c*x^n] + 8*b*Sqrt[e]*n*x*(
d + e*x^2)^(3/2)*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(3*d^3*x*(d + e*x^2)^(
3/2))
```

fricas [A] time = 0.50, size = 399, normalized size = 2.40

$$\left[\frac{4\left(be^2nx^5+2\,bdenx^3+bd^2nx\right)\sqrt{e}\,\log\left(-2\,ex^2-2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)-\left(2\left(be^2n+4\,ae^2\right)x^4+3\,bd^2n+3\,ad^2\right.}{3\left(d^3e^2x^5+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/3*(4*(b*e^2*n*x^5 + 2*b*d*e*n*x^3 + b*d^2*n*x)*sqrt(e)*log(-2*e*x^2 - 2*
sqrt(e*x^2 + d)*sqrt(e)*x - d) - (2*(b*e^2*n + 4*a*e^2)*x^4 + 3*b*d^2*n + 3
*a*d^2 + (5*b*d*e*n + 12*a*d*e)*x^2 + (8*b*e^2*x^4 + 12*b*d*e*x^2 + 3*b*d^2
)*log(c) + (8*b*e^2*n*x^4 + 12*b*d*e*n*x^2 + 3*b*d^2*n)*log(x))*sqrt(e*x^2
+ d))/(d^3*e^2*x^5 + 2*d^4*e*x^3 + d^5*x), -1/3*(8*(b*e^2*n*x^5 + 2*b*d*e*n
*x^3 + b*d^2*n*x)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (2*(b*e^2*n
 + 4*a*e^2)*x^4 + 3*b*d^2*n + 3*a*d^2 + (5*b*d*e*n + 12*a*d*e)*x^2 + (8*b*e
^2*x^4 + 12*b*d*e*x^2 + 3*b*d^2)*log(c) + (8*b*e^2*n*x^4 + 12*b*d*e*n*x^2 +
 3*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^3*e^2*x^5 + 2*d^4*e*x^3 + d^5*x)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^{\frac{5}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(5/2)*x^2), x)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right)+a}{\left(e\,x^2+d\right)^{\frac{5}{2}}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(e*x^2+d)^(5/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^2/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}\,a\left(\frac{8\,ex}{\sqrt{ex^2+d}\,d^3}+\frac{4\,ex}{\left(ex^2+d\right)^{\frac{3}{2}}d^2}+\frac{3}{\left(ex^2+d\right)^{\frac{3}{2}}dx}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{\left(e^2x^6+2\,dex^4+d^2x^2\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3*a*(8*e*x/(sqrt(e*x^2 + d)*d^3) + 4*e*x/((e*x^2 + d)^(3/2)*d^2) + 3/((e
*x^2 + d)^(3/2)*d*x)) + b*integrate((log(c) + log(x^n))/((e^2*x^6 + 2*d*e*x
^4 + d^2*x^2)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^2\,{\left(e\,x^2+d\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)^(5/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.308 $\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=230

$$\frac{16e^2x\left(a+b\log\left(cx^n\right)\right)}{3d^4\sqrt{d+ex^2}}+\frac{8e^2x\left(a+b\log\left(cx^n\right)\right)}{3d^3\left(d+ex^2\right)^{3/2}}+\frac{2e\left(a+b\log\left(cx^n\right)\right)}{d^2x\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{3dx^3\left(d+ex^2\right)^{3/2}}-\frac{16be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}}{\sqrt{d+}}\right.}{3d^4}$$

```
[Out] -16/3*b*e^(3/2)*n*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/d^4+1/3*(-a-b*ln(c*x^n
))/d/x^3/(e*x^2+d)^(3/2)+2*e*(a+b*ln(c*x^n))/d^2/x/(e*x^2+d)^(3/2)+8/3*e^2*
x*(a+b*ln(c*x^n))/d^3/(e*x^2+d)^(3/2)-1/3*b*e^2*n*x/d^4/(e*x^2+d)^(1/2)+16/
3*e^2*x*(a+b*ln(c*x^n))/d^4/(e*x^2+d)^(1/2)-1/9*b*n*(e*x^2+d)^(1/2)/d^3/x^3
+23/9*b*e*n*(e*x^2+d)^(1/2)/d^4/x
```

Rubi [A] time = 0.26, antiderivative size = 230, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {271, 192, 191, 2350, 12, 1805, 1265, 451, 217, 206}

$$\frac{16e^2x\left(a+b\log\left(cx^n\right)\right)}{3d^4\sqrt{d+ex^2}}+\frac{8e^2x\left(a+b\log\left(cx^n\right)\right)}{3d^3\left(d+ex^2\right)^{3/2}}+\frac{2e\left(a+b\log\left(cx^n\right)\right)}{d^2x\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{3dx^3\left(d+ex^2\right)^{3/2}}-\frac{be^2nx}{3d^4\sqrt{d+ex^2}}-\frac{16be^{3/2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^(5/2)),x]
```

```
[Out] -(b*e^2*n*x)/(3*d^4*Sqrt[d + e*x^2]) - (b*n*Sqrt[d + e*x^2])/(9*d^3*x^3) +
(23*b*e*n*Sqrt[d + e*x^2])/(9*d^4*x) - (16*b*e^(3/2)*n*ArcTanh[(Sqrt[e]*x)/
Sqrt[d + e*x^2]])/(3*d^4) - (a + b*Log[c*x^n])/(3*d*x^3*(d + e*x^2)^(3/2))
+ (2*e*(a + b*Log[c*x^n]))/(d^2*x*(d + e*x^2)^(3/2)) + (8*e^2*x*(a + b*Log[
c*x^n]))/(3*d^3*(d + e*x^2)^(3/2)) + (16*e^2*x*(a + b*Log[c*x^n]))/(3*d^4*S
qrt[d + e*x^2])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 1805

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{Q = PolynomialQuotient[(c*x)^m*Pq, a + b*x^2, x], f = Coeff[PolynomialRema
inder[(c*x)^m*Pq, a + b*x^2, x], x, 0], g = Coeff[PolynomialRemainder[(c*x)
^m*Pq, a + b*x^2, x], x, 1]}, Simp[((a*g - b*f*x)*(a + b*x^2)^(p + 1))/(2*a
*b*(p + 1)), x] + Dist[1/(2*a*(p + 1)), Int[(c*x)^m*(a + b*x^2)^(p + 1)*Exp
andToSum[(2*a*(p + 1)*Q)/(c*x)^m + (f*(2*p + 3))/(c*x)^m, x], x], x]] /; Fr
eeQ[{a, b, c}, x] && PolyQ[Pq, x] && LtQ[p, -1] && ILtQ[m, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)^{5/2}}\,dx = -\frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(cx^n))}{d^2x(d+ex^2)^{3/2}} + \frac{8e^2x(a+b\log(cx^n))}{3d^3(d+ex^2)^{3/2}} + \frac{16e^2x(a+b\log(}{3d^4\sqrt{d+ex^2}}$$

$$= -\frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(cx^n))}{d^2x(d+ex^2)^{3/2}} + \frac{8e^2x(a+b\log(cx^n))}{3d^3(d+ex^2)^{3/2}} + \frac{16e^2x(a+b\log(}{3d^4\sqrt{d+ex^2}}$$

$$= -\frac{be^2nx}{3d^4\sqrt{d+ex^2}} - \frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(cx^n))}{d^2x(d+ex^2)^{3/2}} + \frac{8e^2x(a+b\log(cx^n))}{3d^3(d+ex^2)^{3/2}} + \frac{1}{}$$

$$= -\frac{be^2nx}{3d^4\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{9d^3x^3} - \frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(cx^n))}{d^2x(d+ex^2)^{3/2}} + \frac{8e^2x(a+b}{3d^3(d}$$

$$= -\frac{be^2nx}{3d^4\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{9d^3x^3} + \frac{23ben\sqrt{d+ex^2}}{9d^4x} - \frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(}{d^2x(d+ex^2}$$

$$= -\frac{be^2nx}{3d^4\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{9d^3x^3} + \frac{23ben\sqrt{d+ex^2}}{9d^4x} - \frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(}{d^2x(d+ex^2}$$

$$= -\frac{be^2nx}{3d^4\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{9d^3x^3} + \frac{23ben\sqrt{d+ex^2}}{9d^4x} - \frac{16be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^4} - \frac{a+b}{3dx^3(}$$

Mathematica [A] time = 0.23, size = 182, normalized size = 0.79

$$\frac{-3ad^3+18ad^2ex^2+72ade^2x^4+48ae^3x^6+3b\left(-d^3+6d^2ex^2+24de^2x^4+16e^3x^6\right)\log(cx^n)-bd^3n+21bd^2en}{9d^4x^3(d+ex^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^(5/2)),x]
```

```
[Out] (-3*a*d^3 - b*d^3*n + 18*a*d^2*e*x^2 + 21*b*d^2*e*n*x^2 + 72*a*d*e^2*x^4 +
42*b*d*e^2*n*x^4 + 48*a*e^3*x^6 + 20*b*e^3*n*x^6 + 3*b*(-d^3 + 6*d^2*e*x^2
+ 24*d*e^2*x^4 + 16*e^3*x^6)*Log[c*x^n] - 48*b*e^(3/2)*n*x^3*(d + e*x^2)^(3
/2)*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(9*d^4*x^3*(d + e*x^2)^(3/2))
```

fricas [A] time = 0.56, size = 520, normalized size = 2.26

$$\left[\frac{24\left(be^3nx^7+2\,bde^2nx^5+bd^2enx^3\right)\sqrt{e}\,\log\left(-2\,ex^2+2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)+\left(4\left(5\,be^3n+12\,ae^3\right)x^6-bd^3n+\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/9*(24*(b*e^3*n*x^7 + 2*b*d*e^2*n*x^5 + b*d^2*e*n*x^3)*sqrt(e)*log(-2*e*x
^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) + (4*(5*b*e^3*n + 12*a*e^3)*x^6 - b*d
^3*n + 6*(7*b*d*e^2*n + 12*a*d*e^2)*x^4 - 3*a*d^3 + 3*(7*b*d^2*e*n + 6*a*d^
2*e)*x^2 + 3*(16*b*e^3*x^6 + 24*b*d*e^2*x^4 + 6*b*d^2*e*x^2 - b*d^3)*log(c)
 + 3*(16*b*e^3*n*x^6 + 24*b*d*e^2*n*x^4 + 6*b*d^2*e*n*x^2 - b*d^3*n)*log(x)
)*sqrt(e*x^2 + d))/(d^4*e^2*x^7 + 2*d^5*e*x^5 + d^6*x^3), 1/9*(48*(b*e^3*n*
```

```
x^7 + 2*b*d*e^2*n*x^5 + b*d^2*e*n*x^3)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^
2 + d)) + (4*(5*b*e^3*n + 12*a*e^3)*x^6 - b*d^3*n + 6*(7*b*d*e^2*n + 12*a*d
*e^2)*x^4 - 3*a*d^3 + 3*(7*b*d^2*e*n + 6*a*d^2*e)*x^2 + 3*(16*b*e^3*x^6 + 2
4*b*d*e^2*x^4 + 6*b*d^2*e*x^2 - b*d^3)*log(c) + 3*(16*b*e^3*n*x^6 + 24*b*d*
e^2*n*x^4 + 6*b*d^2*e*n*x^2 - b*d^3*n)*log(x))*sqrt(e*x^2 + d))/(d^4*e^2*x^
7 + 2*d^5*e*x^5 + d^6*x^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right) + a}{\left(ex^{2} + d\right)^{\frac{5}{2}}x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(5/2)*x^4), x)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^{n}\right) + a}{\left(e\,x^{2} + d\right)^{\frac{5}{2}}\,x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^4/(e*x^2+d)^(5/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^4/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\,a\left(\frac{16\,e^{2}x}{\sqrt{ex^{2} + d}\,d^{4}} + \frac{8\,e^{2}x}{\left(ex^{2} + d\right)^{\frac{3}{2}}d^{3}} + \frac{6\,e}{\left(ex^{2} + d\right)^{\frac{3}{2}}d^{2}x} - \frac{1}{\left(ex^{2} + d\right)^{\frac{3}{2}}dx^{3}}\right) + b\int \frac{\log(c) + \log\left(x^{n}\right)}{\left(e^{2}x^{8} + 2\,dex^{6} + d^{2}x^{4}\right)\sqrt{ex^{2} + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(16*e^2*x/(sqrt(e*x^2 + d)*d^4) + 8*e^2*x/((e*x^2 + d)^(3/2)*d^3) + 6
*e/((e*x^2 + d)^(3/2)*d^2*x) - 1/((e*x^2 + d)^(3/2)*d*x^3)) + b*integrate((
log(c) + log(x^n))/((e^2*x^8 + 2*d*e*x^6 + d^2*x^4)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b\,\ln\left(c\,x^{n}\right)}{x^{4}\,\left(e\,x^{2} + d\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)^(5/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^4*(d + e*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.309 $\int \frac{x^3(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=251

$$-\frac{d^2\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d-ex}\sqrt{d+ex}}+\frac{\left(d^2-e^2x^2\right)^2\left(a+b\log\left(cx^n\right)\right)}{3e^4\sqrt{d-ex}\sqrt{d+ex}}+\frac{2bd^2n\left(d^2-e^2x^2\right)}{3e^4\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn\left(d^2-e^2x^2\right)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}}-$$

```
[Out] 2/3*b*d^2*n*(-e^2*x^2+d^2)/e^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-1/9*b*n*(-e^2*x
^2+d^2)^2/e^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-d^2*(-e^2*x^2+d^2)*(a+b*ln(c*x^n
))/e^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2)+1/3*(-e^2*x^2+d^2)^2*(a+b*ln(c*x^n))/e^
4/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-2/3*b*d^4*n*arctanh((1-e^2*x^2/d^2)^(1/2))*(
1-e^2*x^2/d^2)^(1/2)/e^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2)
```

Rubi [A] time = 0.52, antiderivative size = 251, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 10, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.303, Rules used = {2342, 266, 43, 2350, 12, 446, 80, 50, 63, 208}

$$-\frac{d^2\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d-ex}\sqrt{d+ex}}+\frac{\left(d^2-e^2x^2\right)^2\left(a+b\log\left(cx^n\right)\right)}{3e^4\sqrt{d-ex}\sqrt{d+ex}}+\frac{2bd^2n\left(d^2-e^2x^2\right)}{3e^4\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn\left(d^2-e^2x^2\right)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}}-$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (2*b*d^2*n*(d^2 - e^2*x^2))/(3*e^4*Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*(d^2
 - e^2*x^2)^2)/(9*e^4*Sqrt[d - e*x]*Sqrt[d + e*x]) - (2*b*d^4*n*Sqrt[1 - (e
^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]])/(3*e^4*Sqrt[d - e*x]*Sqrt[d
+ e*x]) - (d^2*(d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(e^4*Sqrt[d - e*x]*Sqrt[
d + e*x]) + ((d^2 - e^2*x^2)^2*(a + b*Log[c*x^n]))/(3*e^4*Sqrt[d - e*x]*Sqr
t[d + e*x])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
```

```
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{x^3 (a + b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{x^3(a+b\log(cx^n))}{\sqrt{1-\frac{e^2x^2}{d^2}}}dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} + \frac{(d^2-e^2x^2)^2(a+b\log(cx^n))}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right.}{\sqrt{}}$$

$$= -\frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} + \frac{(d^2-e^2x^2)^2(a+b\log(cx^n))}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^2n\sqrt{1-\right.}}{3e^4}$$

$$= -\frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} + \frac{(d^2-e^2x^2)^2(a+b\log(cx^n))}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^2n\sqrt{1-\right.}}{}$$

$$= -\frac{bn(d^2-e^2x^2)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} + \frac{(d^2-e^2x^2)^2(a+b\log}{3e^4\sqrt{d-ex}\sqrt{d+}}$$

$$= \frac{2bd^2n(d^2-e^2x^2)}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn(d^2-e^2x^2)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} +$$

$$= \frac{2bd^2n(d^2-e^2x^2)}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn(d^2-e^2x^2)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} +$$

$$= \frac{2bd^2n(d^2-e^2x^2)}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn(d^2-e^2x^2)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{2bd^4n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right.}{3e^4\sqrt{d-ex}\sqrt{d+ex}}$$

Mathematica [A] time = 0.40, size = 163, normalized size = 0.65

$$-\frac{\sqrt{d-ex}\sqrt{d+ex}\left(d^2(6a+6b\log(cx^n)-6bn\log(x)-5bn)+e^2x^2(3a+3b\log(cx^n)-3bn\log(x)-bn)\right)+}{9e^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] -1/9*(-6*b*d^3*n*Log[x] + 3*b*n*Sqrt[d - e*x]*Sqrt[d + e*x]*(2*d^2 + e^2*x^
2)*Log[x] + Sqrt[d - e*x]*Sqrt[d + e*x]*(e^2*x^2*(3*a - b*n - 3*b*n*Log[x]
+ 3*b*Log[c*x^n]) + d^2*(6*a - 5*b*n - 6*b*n*Log[x] + 6*b*Log[c*x^n])) + 6*
b*d^3*n*Log[d + Sqrt[d - e*x]*Sqrt[d + e*x]])/e^4
```

fricas [A] time = 0.48, size = 125, normalized size = 0.50

$$\frac{6bd^3n\log\left(\frac{\sqrt{ex+d}\sqrt{-ex+d}-d}{x}\right)+\left(5bd^2n-6ad^2+(be^2n-3ae^2)x^2-3(be^2x^2+2bd^2)\log(c)-3(be^2nx^2+2bd\right.}{9e^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="f
ricas")
```

```
[Out] 1/9*(6*b*d^3*n*log((sqrt(e*x + d)*sqrt(-e*x + d) - d)/x) + (5*b*d^2*n - 6*a
*d^2 + (b*e^2*n - 3*a*e^2)*x^2 - 3*(b*e^2*x^2 + 2*b*d^2)*log(c) - 3*(b*e^2*
n*x^2 + 2*b*d^2*n)*log(x))*sqrt(e*x + d)*sqrt(-e*x + d))/e^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log\left(cx^{n}\right) + a\right)x^{3}}{\sqrt{ex+d}\,\sqrt{-ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="g
iac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(sqrt(e*x + d)*sqrt(-e*x + d)), x)
```

maple [F] time = 0.54, size = 0, normalized size = 0.00

$$\int \frac{\left(b \ln\left(c\,x^{n}\right) + a\right)x^{3}}{\sqrt{-ex+d}\,\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int(x^3*(b*ln(c*x^n)+a)/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

maxima [A] time = 1.54, size = 199, normalized size = 0.79

$$-\frac{1}{9}\,bn\left(\frac{3\,d^{3}\log\left(d+\sqrt{-e^{2}x^{2}+d^{2}}\right)}{e^{4}}-\frac{3\,d^{3}\log\left(-d+\sqrt{-e^{2}x^{2}+d^{2}}\right)}{e^{4}}-\frac{6\,\sqrt{-e^{2}x^{2}+d^{2}}\,d^{2}-\left(-e^{2}x^{2}+d^{2}\right)^{\frac{3}{2}}}{e^{4}}\right)-\frac{1}{3}\,b\Bigg(\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="m
axima")
```

```
[Out] -1/9*b*n*(3*d^3*log(d + sqrt(-e^2*x^2 + d^2))/e^4 - 3*d^3*log(-d + sqrt(-e^
2*x^2 + d^2))/e^4 - (6*sqrt(-e^2*x^2 + d^2)*d^2 - (-e^2*x^2 + d^2)^(3/2))/e
^4) - 1/3*b*(sqrt(-e^2*x^2 + d^2)*x^2/e^2 + 2*sqrt(-e^2*x^2 + d^2)*d^2/e^4)
*log(c*x^n) - 1/3*a*(sqrt(-e^2*x^2 + d^2)*x^2/e^2 + 2*sqrt(-e^2*x^2 + d^2)*
d^2/e^4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^{3}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{\sqrt{d+e\,x}\,\sqrt{d-e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/((d + e*x)^(1/2)*(d - e*x)^(1/2)),x)
```

```
[Out] int((x^3*(a + b*log(c*x^n)))/((d + e*x)^(1/2)*(d - e*x)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3}\left(a + b \log\left(cx^{n}\right)\right)}{\sqrt{d - ex}\,\sqrt{d + ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))/(sqrt(d - e*x)*sqrt(d + e*x)), x)
```

3.310 $\int \frac{x(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=148

$$-\frac{(d^2-e^2x^2)(a+b\log(cx^n))}{e^2\sqrt{d-ex}\sqrt{d+ex}}+\frac{bn(d^2-e^2x^2)}{e^2\sqrt{d-ex}\sqrt{d+ex}}-\frac{bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}}$$

```
[Out] b*n*(-e^2*x^2+d^2)/e^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-(-e^2*x^2+d^2)*(a+b*ln(
c*x^n))/e^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-b*d^2*n*arctanh((1-e^2*x^2/d^2)^(1
/2))*(1-e^2*x^2/d^2)^(1/2)/e^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2)
```

Rubi [A] time = 0.30, antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {2342, 2338, 266, 50, 63, 208}

$$-\frac{(d^2-e^2x^2)(a+b\log(cx^n))}{e^2\sqrt{d-ex}\sqrt{d+ex}}+\frac{bn(d^2-e^2x^2)}{e^2\sqrt{d-ex}\sqrt{d+ex}}-\frac{bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (b*n*(d^2 - e^2*x^2))/(e^2*Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*d^2*n*Sqrt[1 -
 (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]])/(e^2*Sqrt[d - e*x]*Sqrt[d
 + e*x]) - ((d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(e^2*Sqrt[d - e*x]*Sqrt[d +
 e*x])
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{\sqrt{1-\frac{e^2x^2}{d^2}}}{x}\,dx}{e^2\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int \frac{\sqrt{1-\frac{e^2x}{d^2}}}{x}\,dx, x, x^2\right)}{2e^2\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{bn\left(d^2-e^2x^2\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int -\right.}{2e^2\sqrt{d-ex}\sqrt{d+}}$$

$$= \frac{bn\left(d^2-e^2x^2\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^4n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int \right.}{e^4\sqrt{d-ex}\sqrt{}}$$

$$= \frac{bn\left(d^2-e^2x^2\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)\left(a+b\log\right.}{e^2\sqrt{d-ex}\sqrt{d+e}}$$

Mathematica [A] time = 0.18, size = 113, normalized size = 0.76

$$-\frac{\sqrt{d-ex}\sqrt{d+ex}\left(a+b\left(\log\left(cx^n\right)-n\log(x)\right)-bn\right)}{e^2}+\frac{bdn\log(x)}{e^2}-\frac{bn\log(x)\sqrt{d-ex}\sqrt{d+ex}}{e^2}-\frac{bdn\log\left(\sqrt{d}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (b*d*n*Log[x])/e^2 - (b*n*Sqrt[d - e*x]*Sqrt[d + e*x]*Log[x])/e^2 - (Sqrt[d
 - e*x]*Sqrt[d + e*x]*(a - b*n + b*(-(n*Log[x]) + Log[c*x^n])))/e^2 - (b*d*
n*Log[d + Sqrt[d - e*x]*Sqrt[d + e*x]])/e^2
```

fricas [A] time = 0.44, size = 66, normalized size = 0.45

$$\frac{bdn\log\left(\frac{\sqrt{ex+d}\,\sqrt{-ex+d}-d}{x}\right)-\left(bn\log(x)-bn+b\log(c)+a\right)\sqrt{ex+d}\,\sqrt{-ex+d}}{e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="fri
cas")
```

```
[Out] (b*d*n*log((sqrt(e*x + d)*sqrt(-e*x + d) - d)/x) - (b*n*log(x) - b*n + b*lo
g(c) + a)*sqrt(e*x + d)*sqrt(-e*x + d))/e^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x}{\sqrt{ex+d}\,\sqrt{-ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(sqrt(e*x + d)*sqrt(-e*x + d)), x)
```

maple [F] time = 0.50, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n)+a)\,x}{\sqrt{-ex+d}\,\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int(x*(b*ln(c*x^n)+a)/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

maxima [A] time = 1.46, size = 105, normalized size = 0.71

$$-\frac{\left(d\log\left(\frac{2\,d^2}{|x|}+\frac{2\,\sqrt{-e^2x^2+d^2}\,d}{|x|}\right)-\sqrt{-e^2x^2+d^2}\right)bn}{e^2}-\frac{\sqrt{-e^2x^2+d^2}\,b\log\left(cx^n\right)}{e^2}-\frac{\sqrt{-e^2x^2+d^2}\,a}{e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="max
ima")
```

```
[Out] -(d*log(2*d^2/abs(x) + 2*sqrt(-e^2*x^2 + d^2)*d/abs(x)) - sqrt(-e^2*x^2 + d
^2))*b*n/e^2 - sqrt(-e^2*x^2 + d^2)*b*log(c*x^n)/e^2 - sqrt(-e^2*x^2 + d^2)
*a/e^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\sqrt{d+e\,x}\,\sqrt{d-e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/((d + e*x)^(1/2)*(d - e*x)^(1/2)),x)
```

```
[Out] int((x*(a + b*log(c*x^n)))/((d + e*x)^(1/2)*(d - e*x)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(a+b\log\left(cx^{n}\right)\right)}{\sqrt{d-ex}\,\sqrt{d+ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Integral(x*(a + b*log(c*x**n))/(sqrt(d - e*x)*sqrt(d + e*x)), x)
```

3.311 $\int \frac{a+b\log(cx^n)}{x\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=301

$$-\frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\operatorname{Li}_2\left(-\frac{\sqrt{1-\frac{e^2x^2}{d^2}}+1}{1-\sqrt{1-\frac{e^2x^2}{d^2}}}\right)}{2\sqrt{d-ex}\sqrt{d+ex}}+\frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2}{d}}\right.}{2\sqrt{d-ex}\sqrt{d+ex}}$$

```
[Out] 1/2*b*n*arctanh((1-e^2*x^2/d^2)^(1/2))^2*(1-e^2*x^2/d^2)^(1/2)/(-e*x+d)^(1/
2)/(e*x+d)^(1/2)-arctanh((1-e^2*x^2/d^2)^(1/2))*(a+b*ln(c*x^n))*(1-e^2*x^2/
d^2)^(1/2)/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-b*n*arctanh((1-e^2*x^2/d^2)^(1/2))*
ln(2/(1-(1-e^2*x^2/d^2)^(1/2)))*(1-e^2*x^2/d^2)^(1/2)/(-e*x+d)^(1/2)/(e*x+d
)^(1/2)-1/2*b*n*polylog(2,(-1-(1-e^2*x^2/d^2)^(1/2))/(1-(1-e^2*x^2/d^2)^(1/
2)))*(1-e^2*x^2/d^2)^(1/2)/(-e*x+d)^(1/2)/(e*x+d)^(1/2)
```

Rubi [A] time = 0.60, antiderivative size = 301, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 9, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2342, 266, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\text{PolyLog}\left(2,-\frac{\sqrt{1-\frac{e^2x^2}{d^2}}+1}{1-\sqrt{1-\frac{e^2x^2}{d^2}}}\right)}{2\sqrt{d-ex}\sqrt{d+ex}}-\frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d-ex}\sqrt{d+ex}}+\frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\right.}{2\sqrt{d-ex}\sqrt{d+\right.}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (b*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]]^2)/(2*Sqrt[d
- e*x]*Sqrt[d + e*x]) - (Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)
/d^2]]*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*Sqrt[1 - (e
^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]]*Log[2/(1 - Sqrt[1 - (e^2*x^2)
/d^2])])/(Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyL
og[2, -((1 + Sqrt[1 - (e^2*x^2)/d^2])/(1 - Sqrt[1 - (e^2*x^2)/d^2]))])/(2*S
qrt[d - e*x]*Sqrt[d + e*x])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{a+b\log(cx^n)}{x\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{x}}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int \frac{\tanh^{-1}\left(\sqrt{\right.}{x}\right.}{2\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int \frac{x\tanh^{-1}(x}{-1+x^2}\right.}{\sqrt{d-ex}\sqrt{d+e}}$$

$$= \frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)^2}{2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)^2}{2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)^2}{2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)^2}{2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}$$

Mathematica [A] time = 1.83, size = 310, normalized size = 1.03

$$-\frac{\log\left(\sqrt{d-ex}\sqrt{d+ex}+d\right)(a+b\log(cx^n)-bn\log(x))}{d}+\frac{\log(x)(a+b\log(cx^n)-bn\log(x))}{d}+\frac{bn\sqrt{e^2x^2-d^2}\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (Log[x]*(a - b*n*Log[x] + b*Log[c*x^n]))/d - ((a - b*n*Log[x] + b*Log[c*x^n
])*Log[d + Sqrt[d - e*x]*Sqrt[d + e*x]])/d + (b*n*Sqrt[-d^2 + e^2*x^2]*((-4
*ArcTanh[Sqrt[-d^2 + e^2*x^2]/Sqrt[-d^2]]*(2*Log[x] - Log[(e^2*x^2)/d^2]))/
Sqrt[-d^2] + (Sqrt[1 - (e^2*x^2)/d^2]*(Log[(e^2*x^2)/d^2]^2 - 4*Log[(e^2*x^
2)/d^2]*Log[(1 + Sqrt[1 - (e^2*x^2)/d^2])/2] + 2*Log[(1 + Sqrt[1 - (e^2*x^2
)/d^2])/2]^2 - 4*PolyLog[2, 1/2 - Sqrt[1 - (e^2*x^2)/d^2]/2]))/Sqrt[-d^2 +
e^2*x^2]))/(8*Sqrt[d - e*x]*Sqrt[d + e*x])
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{\sqrt{ex+d}\,\sqrt{-ex+d}\,b\log\left(cx^{n}\right)+\sqrt{ex+d}\,\sqrt{-ex+d}\,a}{e^{2}x^{3}-d^{2}x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="fri
cas")
```

```
[Out] integral(-(sqrt(e*x + d)*sqrt(-e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*sqrt(-
e*x + d)*a)/(e^2*x^3 - d^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right)+a}{\sqrt{ex+d}\,\sqrt{-ex+d}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*sqrt(-e*x + d)*x), x)
```

maple [F] time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^{n}\right)+a}{\sqrt{-ex+d}\,\sqrt{ex+d}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b\int \frac{\log(c)+\log\left(x^{n}\right)}{\sqrt{ex+d}\,\sqrt{-ex+d}\,x}\,dx-\frac{a\log\left(\frac{2\,d^{2}}{|x|}+\frac{2\,\sqrt{-e^{2}x^{2}+d^{2}}\,d}{|x|}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="max
ima")
```

```
[Out] b*integrate((log(c) + log(x^n))/(sqrt(e*x + d)*sqrt(-e*x + d)*x), x) - a*lo
g(2*d^2/abs(x) + 2*sqrt(-e^2*x^2 + d^2)*d/abs(x))/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^{n}\right)}{x\,\sqrt{d+e\,x}\,\sqrt{d-e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x)^(1/2)*(d - e*x)^(1/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x)^(1/2)*(d - e*x)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\log(cx^n)}{x\sqrt{d - ex}\,\sqrt{d + ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x*sqrt(d - e*x)*sqrt(d + e*x)), x)
```

3.312 $\int \frac{a+b\log(cx^n)}{x^3\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=489

$$-\frac{(d^2-e^2x^2)\,(a+b\log(cx^n))}{2d^2x^2\sqrt{d-ex}\,\sqrt{d+ex}}-\frac{e^2\sqrt{1-\frac{e^2x^2}{d^2}}\,\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{2d^2\sqrt{d-ex}\,\sqrt{d+ex}}-\frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\,\mathrm{Li}_2\left(-\frac{\sqrt{1-\frac{e^2\cdots}{d\cdots}}}{1-\sqrt{1-\cdots}}\cdots\right.}{4d^2\sqrt{d-ex}\,\sqrt{d+ex}}$$

```
[Out] -1/4*b*n*(-e^2*x^2+d^2)/d^2/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-1/2*(-e^2*x^2+
d^2)*(a+b*ln(c*x^n))/d^2/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2)+1/4*b*e^2*n*arcta
nh((1-e^2*x^2/d^2)^(1/2))*(1-e^2*x^2/d^2)^(1/2)/d^2/(-e*x+d)^(1/2)/(e*x+d)^
(1/2)+1/4*b*e^2*n*arctanh((1-e^2*x^2/d^2)^(1/2))^2*(1-e^2*x^2/d^2)^(1/2)/d^
2/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-1/2*e^2*arctanh((1-e^2*x^2/d^2)^(1/2))*(a+b*
ln(c*x^n))*(1-e^2*x^2/d^2)^(1/2)/d^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-1/2*b*e^2
*n*arctanh((1-e^2*x^2/d^2)^(1/2))*ln(2/(1-(1-e^2*x^2/d^2)^(1/2)))*(1-e^2*x^
2/d^2)^(1/2)/d^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-1/4*b*e^2*n*polylog(2,(-1-(1-
e^2*x^2/d^2)^(1/2))/(1-(1-e^2*x^2/d^2)^(1/2)))*(1-e^2*x^2/d^2)^(1/2)/d^2/(-
e*x+d)^(1/2)/(e*x+d)^(1/2)
```

Rubi [A] time = 0.72, antiderivative size = 489, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2342, 266, 51, 63, 208, 2350, 47, 5984, 5918, 2402, 2315}

$$-\frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{1-\frac{e^2x^2}{d^2}}+1}{1-\sqrt{1-\frac{e^2x^2}{d^2}}}\right)}{4d^2\sqrt{d-ex}\,\sqrt{d+ex}}-\frac{(d^2-e^2x^2)\,(a+b\log(cx^n))}{2d^2x^2\sqrt{d-ex}\,\sqrt{d+ex}}-\frac{e^2\sqrt{1-\frac{e^2x^2}{d^2}}\,\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a\cdots}{2d^2\sqrt{d-ex}\,\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] -(b*n*(d^2 - e^2*x^2))/(4*d^2*x^2*Sqrt[d - e*x]*Sqrt[d + e*x]) + (b*e^2*n*S
qrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]])/(4*d^2*Sqrt[d - e*
x]*Sqrt[d + e*x]) + (b*e^2*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*
x^2)/d^2]]^2)/(4*d^2*Sqrt[d - e*x]*Sqrt[d + e*x]) - ((d^2 - e^2*x^2)*(a + b
*Log[c*x^n]))/(2*d^2*x^2*Sqrt[d - e*x]*Sqrt[d + e*x]) - (e^2*Sqrt[1 - (e^2*
x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]]*(a + b*Log[c*x^n]))/(2*d^2*Sqrt[
d - e*x]*Sqrt[d + e*x]) - (b*e^2*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 -
 (e^2*x^2)/d^2]]*Log[2/(1 - Sqrt[1 - (e^2*x^2)/d^2])])/(2*d^2*Sqrt[d - e*x]
*Sqrt[d + e*x]) - (b*e^2*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyLog[2, -((1 + Sqrt[1
 - (e^2*x^2)/d^2])/(1 - Sqrt[1 - (e^2*x^2)/d^2]))])/(4*d^2*Sqrt[d - e*x]*Sq
rt[d + e*x])
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
```

```
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
```

]

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{a+b\log(cx^n)}{x^3\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\left(d^2-e^2x^2\right)\left(a+b\log(cx^n)\right)}{2d^2x^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{e^2\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)\left(a+b\log(cx^n)\right)}{2d^2\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\left(d^2-e^2x^2\right)\left(a+b\log(cx^n)\right)}{2d^2x^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{e^2\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)\left(a+b\log(cx^n)\right)}{2d^2\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\left(d^2-e^2x^2\right)\left(a+b\log(cx^n)\right)}{2d^2x^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{e^2\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)\left(a+b\log(cx^n)\right)}{2d^2\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{bn\left(d^2-e^2x^2\right)}{4d^2x^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)\left(a+b\log(cx^n)\right)}{2d^2x^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{e^2\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{\right.}{2d^2\sqrt{d-}}$$

$$= -\frac{bn\left(d^2-e^2x^2\right)}{4d^2x^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)^2}{4d^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)\left(a\right.}{2d^2x^2\sqrt{d-}}$$

$$= -\frac{bn\left(d^2-e^2x^2\right)}{4d^2x^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{4d^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\,t}{4d^2\sqrt{d-}}$$

$$= -\frac{bn\left(d^2-e^2x^2\right)}{4d^2x^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{4d^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\,t}{4d^2\sqrt{d-}}$$

$$= -\frac{bn\left(d^2-e^2x^2\right)}{4d^2x^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{4d^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\,t}{4d^2\sqrt{d-}}$$

Mathematica [C] time = 0.88, size = 255, normalized size = 0.52

$$\frac{\frac{bn(e^2x^2-d^2)\left(2d^3\,{}_3F_2\left(\frac{3}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};\frac{d^2}{e^2x^2}\right)+9e^2x^2(2\log(x)+1)\left(d\sqrt{1-\frac{d^2}{e^2x^2}}-ex\sin^{-1}\left(\frac{d}{ex}\right)\right)\right)}{e^2x^4\sqrt{1-\frac{d^2}{e^2x^2}}\sqrt{d-ex}\sqrt{d+ex}}-18e^2\log\left(\sqrt{d-ex}\sqrt{d+ex}+d\right)\left(a+b\log(c\right.}{36d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] ((b*n*(-d^2 + e^2*x^2)*(2*d^3*HypergeometricPFQ[{3/2, 3/2, 3/2}, {5/2, 5/2}
, d^2/(e^2*x^2)] + 9*e^2*x^2*(d*Sqrt[1 - d^2/(e^2*x^2)] - e*x*ArcSin[d/(e*x
)])*(1 + 2*Log[x])))/(e^2*Sqrt[1 - d^2/(e^2*x^2)]*x^4*Sqrt[d - e*x]*Sqrt[d
+ e*x]) - (18*d*Sqrt[d - e*x]*Sqrt[d + e*x]*(a - b*n*Log[x] + b*Log[c*x^n])
)/x^2 + 18*e^2*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n]) - 18*e^2*(a - b*n*Log
[x] + b*Log[c*x^n])*Log[d + Sqrt[d - e*x]*Sqrt[d + e*x]])/(36*d^3)
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{\sqrt{ex+d}\sqrt{-ex+d}\,b\log\left(cx^n\right)+\sqrt{ex+d}\sqrt{-ex+d}\,a}{e^2x^5-d^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="f
ricas")
```

```
[Out] integral(-(sqrt(e*x + d)*sqrt(-e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*sqrt(-
e*x + d)*a)/(e^2*x^5 - d^2*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\log\left(cx^n\right)+a}{\sqrt{ex+d}\sqrt{-ex+d}\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="g
iac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*sqrt(-e*x + d)*x^3), x)
```

maple [F] time = 0.50, size = 0, normalized size = 0.00

$$\int\frac{b\ln\left(c\,x^n\right)+a}{\sqrt{-ex+d}\,\sqrt{ex+d}\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}a\left(\frac{e^2\log\left(\frac{2d^2}{|x|}+\frac{2\sqrt{-e^2x^2+d^2}\,d}{|x|}\right)}{d^3}+\frac{\sqrt{-e^2x^2+d^2}}{d^2x^2}\right)+b\int\frac{\log(c)+\log\left(x^n\right)}{\sqrt{ex+d}\sqrt{-ex+d}\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="m
axima")
```

```
[Out] -1/2*a*(e^2*log(2*d^2/abs(x) + 2*sqrt(-e^2*x^2 + d^2)*d/abs(x))/d^3 + sqrt(
-e^2*x^2 + d^2)/(d^2*x^2)) + b*integrate((log(c) + log(x^n))/(sqrt(e*x + d)
*sqrt(-e*x + d)*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,\sqrt{d+e\,x}\,\sqrt{d-e\,x}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x)^(1/2)*(d - e*x)^(1/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x)^(1/2)*(d - e*x)^(1/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

3.313 $\int \frac{x^2\left(a+b\log(cx^n)\right)}{\sqrt{d-ex}\,\sqrt{d+ex}}\,dx$

Optimal. Leaf size=406

$$-\frac{x\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2e^2\sqrt{d-ex}\,\sqrt{d+ex}}+\frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\,\sin^{-1}\left(\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3\sqrt{d-ex}\,\sqrt{d+ex}}+\frac{bnx\left(d^2-e^2x^2\right)}{4e^2\sqrt{d-ex}\,\sqrt{d+ex}}+\frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}}{4e^3\sqrt{d-e}}$$

```
[Out] 1/4*b*n*x*(-e^2*x^2+d^2)/e^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-1/2*x*(-e^2*x^2+d
^2)*(a+b*ln(c*x^n))/e^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2)+1/4*b*d^3*n*arcsin(e*x
/d)*(1-e^2*x^2/d^2)^(1/2)/e^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2)+1/4*I*b*d^3*n*ar
csin(e*x/d)^2*(1-e^2*x^2/d^2)^(1/2)/e^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-1/2*b*
d^3*n*arcsin(e*x/d)*ln(1-(I*e*x/d+(1-e^2*x^2/d^2)^(1/2))^2)*(1-e^2*x^2/d^2)
^(1/2)/e^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2)+1/2*d^3*arcsin(e*x/d)*(a+b*ln(c*x^n
))*(1-e^2*x^2/d^2)^(1/2)/e^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2)+1/4*I*b*d^3*n*pol
ylog(2,(I*e*x/d+(1-e^2*x^2/d^2)^(1/2))^2)*(1-e^2*x^2/d^2)^(1/2)/e^3/(-e*x+d
)^(1/2)/(e*x+d)^(1/2)
```

Rubi [A] time = 0.61, antiderivative size = 406, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 12, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {2342, 321, 216, 2350, 12, 14, 195, 4625, 3717, 2190, 2279, 2391}

$$\frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{4e^3\sqrt{d-ex}\,\sqrt{d+ex}}-\frac{x\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2e^2\sqrt{d-ex}\,\sqrt{d+ex}}+\frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\,\sin^{-1}\left(\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3\sqrt{d-ex}\,\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (b*n*x*(d^2 - e^2*x^2))/(4*e^2*Sqrt[d - e*x]*Sqrt[d + e*x]) + (b*d^3*n*Sqrt
[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d])/(4*e^3*Sqrt[d - e*x]*Sqrt[d + e*x]) +
((I/4)*b*d^3*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]^2)/(e^3*Sqrt[d - e*x
]*Sqrt[d + e*x]) - (b*d^3*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]*Log[1 -
 E^((2*I)*ArcSin[(e*x)/d])])/(2*e^3*Sqrt[d - e*x]*Sqrt[d + e*x]) - (x*(d^2
- e^2*x^2)*(a + b*Log[c*x^n]))/(2*e^2*Sqrt[d - e*x]*Sqrt[d + e*x]) + (d^3*S
qrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]*(a + b*Log[c*x^n]))/(2*e^3*Sqrt[d -
e*x]*Sqrt[d + e*x]) + ((I/4)*b*d^3*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyLog[2, E^(
(2*I)*ArcSin[(e*x)/d])])/(e^3*Sqrt[d - e*x]*Sqrt[d + e*x])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{x^2 \left(a+b\log\left(cx^n\right)\right)}{\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{x\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bn\sqrt{1\ldots\right.}{\ldots}$$

$$= -\frac{x\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^2n\ldots\right.}{\ldots}$$

$$= -\frac{x\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^2n\ldots\right.}{\ldots}$$

$$= -\frac{x\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^3n\ldots\right.}{2e\ldots}$$

$$= \frac{bnx\left(d^2-e^2x^2\right)}{4e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{x\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\left(a+\ldots\right.}{2e^3\sqrt{d-ex}\sqrt{d+e\ldots}}$$

$$= \frac{bnx\left(d^2-e^2x^2\right)}{4e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{bd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{4e^3\sqrt{d-ex}\sqrt{d+ex}} + \frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{4e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{x(\ldots}{\ldots}$$

$$= \frac{bnx\left(d^2-e^2x^2\right)}{4e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{bd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{4e^3\sqrt{d-ex}\sqrt{d+ex}} + \frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{4e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{bd\ldots}{\ldots}$$

$$= \frac{bnx\left(d^2-e^2x^2\right)}{4e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{bd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{4e^3\sqrt{d-ex}\sqrt{d+ex}} + \frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{4e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{bd\ldots}{\ldots}$$

$$= \frac{bnx\left(d^2-e^2x^2\right)}{4e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{bd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{4e^3\sqrt{d-ex}\sqrt{d+ex}} + \frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{4e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{bd\ldots}{\ldots}$$

Mathematica [A] time = 2.79, size = 316, normalized size = 0.78

$$2d^2\tan^{-1}\left(\frac{ex}{\sqrt{d-ex}\sqrt{d+ex}}\right)\left(a+b\log\left(cx^n\right)-bn\log(x)\right) - 2ex\sqrt{d-ex}\sqrt{d+ex}\left(a+b\log\left(cx^n\right)-bn\log(x)\right) + \frac{bn\left(ex(2\ldots\right.}{\ldots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (-2*e*x*Sqrt[d - e*x]*Sqrt[d + e*x]*(a - b*n*Log[x] + b*Log[c*x^n]) + 2*d^2
*ArcTan[(e*x)/(Sqrt[d - e*x]*Sqrt[d + e*x])]*(a - b*n*Log[x] + b*Log[c*x^n]
) + (b*n*(d^3*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d] + e*x*(-d^2 + e^2*x^2
)*(-1 + 2*Log[x]) + (e^3*Sqrt[1 - (e^2*x^2)/d^2]*(ArcSinh[Sqrt[-(e^2/d^2)]*
x]^2 + 2*ArcSinh[Sqrt[-(e^2/d^2)]*x]*Log[1 - E^(-2*ArcSinh[Sqrt[-(e^2/d^2)]
*x])] - 2*Log[x]*Log[Sqrt[-(e^2/d^2)]*x + Sqrt[1 - (e^2*x^2)/d^2]] - PolyLo
g[2, E^(-2*ArcSinh[Sqrt[-(e^2/d^2)]*x])]))/(-(e^2/d^2))^(3/2)))/(Sqrt[d - e
*x]*Sqrt[d + e*x]))/(4*e^3)
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{\sqrt{ex+d}\,\sqrt{-ex+d}\,bx^2\log\left(cx^n\right)+\sqrt{ex+d}\,\sqrt{-ex+d}\,ax^2}{e^2x^2-d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="f
ricas")
```

```
[Out] integral(-(sqrt(e*x + d)*sqrt(-e*x + d)*b*x^2*log(c*x^n) + sqrt(e*x + d)*sq
rt(-e*x + d)*a*x^2)/(e^2*x^2 - d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^2}{\sqrt{ex+d}\,\sqrt{-ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="g
iac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(sqrt(e*x + d)*sqrt(-e*x + d)), x)
```

maple [F] time = 0.50, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)x^2}{\sqrt{-ex+d}\,\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int(x^2*(b*ln(c*x^n)+a)/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{d^2\arcsin\left(\frac{ex}{d}\right)}{e^3}-\frac{\sqrt{-e^2x^2+d^2}\,x}{e^2}\right)+b\int \frac{x^2\log(c)+x^2\log\left(x^n\right)}{\sqrt{ex+d}\,\sqrt{-ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="m
axima")
```

```
[Out] 1/2*a*(d^2*arcsin(e*x/d)/e^3 - sqrt(-e^2*x^2 + d^2)*x/e^2) + b*integrate((x
^2*log(c) + x^2*log(x^n))/(sqrt(e*x + d)*sqrt(-e*x + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\sqrt{d+e\,x}\,\sqrt{d-e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/((d + e*x)^(1/2)*(d - e*x)^(1/2)),x)
[Out] int((x^2*(a + b*log(c*x^n)))/((d + e*x)^(1/2)*(d - e*x)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \left(a + b \log \left(c x^n\right)\right)}{\sqrt{d - e x}\,\sqrt{d + e x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
[Out] Integral(x**2*(a + b*log(c*x**n))/(sqrt(d - e*x)*sqrt(d + e*x)), x)
```

3.314 $\int \frac{a+b\log(cx^n)}{\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=248

$$\frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d-ex}\sqrt{d+ex}}+\frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\operatorname{Li}_2\left(e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{2e\sqrt{d-ex}\sqrt{d+ex}}+\frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}}-\frac{bdn\sqrt{1-}}{}$$

```
[Out] 1/2*I*b*d*n*arcsin(e*x/d)^2*(1-e^2*x^2/d^2)^(1/2)/e/(-e*x+d)^(1/2)/(e*x+d)^
(1/2)-b*d*n*arcsin(e*x/d)*ln(1-(I*e*x/d+(1-e^2*x^2/d^2)^(1/2))^2)*(1-e^2*x^
2/d^2)^(1/2)/e/(-e*x+d)^(1/2)/(e*x+d)^(1/2)+d*arcsin(e*x/d)*(a+b*ln(c*x^n))
*(1-e^2*x^2/d^2)^(1/2)/e/(-e*x+d)^(1/2)/(e*x+d)^(1/2)+1/2*I*b*d*n*polylog(2
,(I*e*x/d+(1-e^2*x^2/d^2)^(1/2))^2)*(1-e^2*x^2/d^2)^(1/2)/e/(-e*x+d)^(1/2)/
(e*x+d)^(1/2)
```

Rubi [A] time = 0.22, antiderivative size = 248, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {2328, 2326, 4625, 3717, 2190, 2279, 2391}

$$\frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\operatorname{PolyLog}\left(2,e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{2e\sqrt{d-ex}\sqrt{d+ex}}+\frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d-ex}\sqrt{d+ex}}+\frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}}-$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] ((I/2)*b*d*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]^2)/(e*Sqrt[d - e*x]*Sq
rt[d + e*x]) - (b*d*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]*Log[1 - E^((2
*I)*ArcSin[(e*x)/d])])/(e*Sqrt[d - e*x]*Sqrt[d + e*x]) + (d*Sqrt[1 - (e^2*x
^2)/d^2]*ArcSin[(e*x)/d]*(a + b*Log[c*x^n]))/(e*Sqrt[d - e*x]*Sqrt[d + e*x]
) + ((I/2)*b*d*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyLog[2, E^((2*I)*ArcSin[(e*x)/d
])])/(e*Sqrt[d - e*x]*Sqrt[d + e*x])
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2326

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[-e, 2], x
] - Dist[(b*n)/Rt[-e, 2], Int[ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 2328

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(Sqrt[(d1_) + (e1_.)*(x_)]*Sqrt[(
d2_) + (e2_.)*(x_)]), x_Symbol] :> Dist[Sqrt[1 + (e1*e2*x^2)/(d1*d2)]/(Sqrt
[d1 + e1*x]*Sqrt[d2 + e2*x]), Int[(a + b*Log[c*x^n])/Sqrt[1 + (e1*e2*x^2)/(
```

```
d1*d2)], x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*e1 + d1
*e2, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{a+b\log(cx^n)}{\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\left(a+b\log(cx^n)\right)}{e\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bdn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{\sin^{-1}\left(\frac{ex}{d}\right)}{x}\,dx}{e\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\left(a+b\log(cx^n)\right)}{e\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bdn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int x\cot(x)\,dx, x, \sin^{-}\right.}{e\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}} + \frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\left(a+b\log(cx^n)\right)}{e\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(2ibdn\sqrt{1-\frac{e^2x}{d^2}}\right.}{}$$

$$= \frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}} - \frac{bdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\log\left(1-e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{e\sqrt{d-ex}\sqrt{d+ex}} + \frac{d\sqrt{1-\frac{e^2x}{d^2}}}{}$$

$$= \frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}} - \frac{bdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\log\left(1-e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{e\sqrt{d-ex}\sqrt{d+ex}} + \frac{d\sqrt{1-\frac{e^2x}{d^2}}}{}$$

$$= \frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}} - \frac{bdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\log\left(1-e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{e\sqrt{d-ex}\sqrt{d+ex}} + \frac{d\sqrt{1-\frac{e^2x}{d^2}}}{}$$

Mathematica [A] time = 0.55, size = 217, normalized size = 0.88

$$\frac{\tan^{-1}\left(\frac{ex}{\sqrt{d-ex}\sqrt{d+ex}}\right)\left(a+b\log(cx^n)-bn\log(x)\right)}{e} - \frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\left(-\text{Li}_2\left(e^{-2\sinh^{-1}\left(\sqrt{-\frac{e^2}{d^2}}x\right)}\right)-2\log(x)\log\left(\sqrt{1-\frac{e^2x}{d^2}}\right.\right.}{2\cdot}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (ArcTan[(e*x)/(Sqrt[d - e*x]*Sqrt[d + e*x])]*(a - b*n*Log[x] + b*Log[c*x^n]
))/e - (b*n*Sqrt[1 - (e^2*x^2)/d^2]*(ArcSinh[Sqrt[-(e^2/d^2)]*x]^2 + 2*ArcS
inh[Sqrt[-(e^2/d^2)]*x]*Log[1 - E^(-2*ArcSinh[Sqrt[-(e^2/d^2)]*x])] - 2*Log
[x]*Log[Sqrt[-(e^2/d^2)]*x + Sqrt[1 - (e^2*x^2)/d^2]] - PolyLog[2, E^(-2*Ar
cSinh[Sqrt[-(e^2/d^2)]*x])]))/(2*Sqrt[-(e^2/d^2)]*Sqrt[d - e*x]*Sqrt[d + e*
x])
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{\sqrt{ex+d}\,\sqrt{-ex+d}\,b\log\left(cx^{n}\right)+\sqrt{ex+d}\,\sqrt{-ex+d}\,a}{e^{2}x^{2}-d^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="frica
s")
```

```
[Out] integral(-(sqrt(e*x + d)*sqrt(-e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*sqrt(-
e*x + d)*a)/(e^2*x^2 - d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right)+a}{\sqrt{ex+d}\,\sqrt{-ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*sqrt(-e*x + d)), x)
```

maple [F] time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^{n}\right)+a}{\sqrt{-ex+d}\,\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b\int \frac{\log(c)+\log\left(x^{n}\right)}{\sqrt{ex+d}\,\sqrt{-ex+d}}\,dx+\frac{a\arcsin\left(\frac{ex}{d}\right)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="maxim
a")
```

```
[Out] b*integrate((log(c) + log(x^n))/(sqrt(e*x + d)*sqrt(-e*x + d)), x) + a*arcs
in(e*x/d)/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^{n}\right)}{\sqrt{d+e\,x}\,\sqrt{d-e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/((d + e*x)^(1/2)*(d - e*x)^(1/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/((d + e*x)^(1/2)*(d - e*x)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \log{\left(c x^{n} \right)}}{\sqrt{d - e x} \sqrt{d + e x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(sqrt(d - e*x)*sqrt(d + e*x)), x)
```

3.315 $\int \frac{a+b\log(cx^n)}{x^2\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=142

$$-\frac{(d^2-e^2x^2)(a+b\log(cx^n))}{d^2x\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn(d^2-e^2x^2)}{d^2x\sqrt{d-ex}\sqrt{d+ex}}-\frac{ben\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{d\sqrt{d-ex}\sqrt{d+ex}}$$

```
[Out] -b*n*(-e^2*x^2+d^2)/d^2/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-(-e^2*x^2+d^2)*(a+b*
ln(c*x^n))/d^2/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-b*e*n*arcsin(e*x/d)*(1-e^2*x^
2/d^2)^(1/2)/d/(-e*x+d)^(1/2)/(e*x+d)^(1/2)
```

Rubi [A] time = 0.40, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {2342, 2335, 277, 216}

$$-\frac{(d^2-e^2x^2)(a+b\log(cx^n))}{d^2x\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn(d^2-e^2x^2)}{d^2x\sqrt{d-ex}\sqrt{d+ex}}-\frac{ben\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{d\sqrt{d-ex}\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] -((b*n*(d^2 - e^2*x^2))/(d^2*x*Sqrt[d - e*x]*Sqrt[d + e*x])) - (b*e*n*Sqrt[
1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d])/(d*Sqrt[d - e*x]*Sqrt[d + e*x]) - ((d^2
 - e^2*x^2)*(a + b*Log[c*x^n]))/(d^2*x*Sqrt[d - e*x]*Sqrt[d + e*x])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{a+b\log(cx^n)}{x^2\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{(d^2-e^2x^2)(a+b\log(cx^n))}{d^2x\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{\sqrt{1-\frac{e^2x^2}{d^2}}}{x^2}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{bn(d^2-e^2x^2)}{d^2x\sqrt{d-ex}\sqrt{d+ex}} - \frac{(d^2-e^2x^2)(a+b\log(cx^n))}{d^2x\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{1}{\sqrt{1-\frac{e^2x^2}{d^2}}}}{d^2\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{bn(d^2-e^2x^2)}{d^2x\sqrt{d-ex}\sqrt{d+ex}} - \frac{ben\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{d\sqrt{d-ex}\sqrt{d+ex}} - \frac{(d^2-e^2x^2)(a+b\log(cx^n))}{d^2x\sqrt{d-ex}\sqrt{d+ex}}$$

Mathematica [A] time = 0.23, size = 70, normalized size = 0.49

$$-\frac{\sqrt{d-ex}\sqrt{d+ex}\,(a+b\log(cx^n)+bn)+benx\tan^{-1}\left(\frac{ex}{\sqrt{d-ex}\sqrt{d+ex}}\right)}{d^2x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] -((b*e*n*x*ArcTan[(e*x)/(Sqrt[d - e*x]*Sqrt[d + e*x])] + Sqrt[d - e*x]*Sqrt
[d + e*x]*(a + b*n + b*Log[c*x^n]))/(d^2*x))
```

fricas [A] time = 0.44, size = 73, normalized size = 0.51

$$\frac{2\,benx\arctan\left(\frac{\sqrt{ex+d}\sqrt{-ex+d}-d}{ex}\right)-\left(bn\log(x)+bn+b\log(c)+a\right)\sqrt{ex+d}\sqrt{-ex+d}}{d^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="f
ricas")
```

```
[Out] (2*b*e*n*x*arctan((sqrt(e*x + d)*sqrt(-e*x + d) - d)/(e*x)) - (b*n*log(x) +
 b*n + b*log(c) + a)*sqrt(e*x + d)*sqrt(-e*x + d))/(d^2*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{\sqrt{ex+d}\sqrt{-ex+d}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="g
iac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*sqrt(-e*x + d)*x^2), x)
```

maple [F] time = 0.50, size = 0, normalized size = 0.00

$$\int \frac{b\ln(c\,x^n)+a}{\sqrt{-ex+d}\,\sqrt{ex+d}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

maxima [A] time = 1.24, size = 88, normalized size = 0.62

$$-\frac{\left(e \arcsin\left(\frac{ex}{d}\right) + \frac{\sqrt{-e^2x^2+d^2}}{x}\right)bn}{d^2} - \frac{\sqrt{-e^2x^2+d^2}\,b\log\left(cx^n\right)}{d^2x} - \frac{\sqrt{-e^2x^2+d^2}\,a}{d^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="m
axima")
```

```
[Out] -(e*arcsin(e*x/d) + sqrt(-e^2*x^2 + d^2)/x)*b*n/d^2 - sqrt(-e^2*x^2 + d^2)*
b*log(c*x^n)/(d^2*x) - sqrt(-e^2*x^2 + d^2)*a/(d^2*x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^2\,\sqrt{d+e\,x}\,\sqrt{d-e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x)^(1/2)*(d - e*x)^(1/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x)^(1/2)*(d - e*x)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\log\left(cx^n\right)}{x^2\sqrt{d-ex}\sqrt{d+ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**2*sqrt(d - e*x)*sqrt(d + e*x)), x)
```

3.316 $\int \frac{a+b\log(cx^n)}{x^4\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=252

$$-\frac{(d^2-e^2x^2)(a+b\log(cx^n))}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}}-\frac{2e^2(d^2-e^2x^2)(a+b\log(cx^n))}{3d^4x\sqrt{d-ex}\sqrt{d+ex}}-\frac{2be^2n(d^2-e^2x^2)}{3d^4x\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn(d^2-e^2x^2)^2}{9d^4x^3\sqrt{d-ex}\sqrt{d+ex}}-$$

```
[Out] -2/3*b*e^2*n*(-e^2*x^2+d^2)/d^4/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-1/9*b*n*(-e^
2*x^2+d^2)^2/d^4/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-1/3*(-e^2*x^2+d^2)*(a+b*l
n(c*x^n))/d^2/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-2/3*e^2*(-e^2*x^2+d^2)*(a+b*
ln(c*x^n))/d^4/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2)-2/3*b*e^3*n*arcsin(e*x/d)*(1-
e^2*x^2/d^2)^(1/2)/d^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2)
```

Rubi [A] time = 0.48, antiderivative size = 252, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {2342, 271, 264, 2350, 12, 451, 277, 216}

$$-\frac{2e^2(d^2-e^2x^2)(a+b\log(cx^n))}{3d^4x\sqrt{d-ex}\sqrt{d+ex}}-\frac{(d^2-e^2x^2)(a+b\log(cx^n))}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}}-\frac{2be^2n(d^2-e^2x^2)}{3d^4x\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn(d^2-e^2x^2)^2}{9d^4x^3\sqrt{d-ex}\sqrt{d+ex}}-$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (-2*b*e^2*n*(d^2 - e^2*x^2))/(3*d^4*x*Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*(
d^2 - e^2*x^2)^2)/(9*d^4*x^3*Sqrt[d - e*x]*Sqrt[d + e*x]) - (2*b*e^3*n*Sqrt
[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d])/(3*d^3*Sqrt[d - e*x]*Sqrt[d + e*x]) -
((d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(3*d^2*x^3*Sqrt[d - e*x]*Sqrt[d + e*x]
) - (2*e^2*(d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(3*d^4*x*Sqrt[d - e*x]*Sqrt[
d + e*x])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
```

```
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{a+b\log(cx^n)}{x^4\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\left(d^2-e^2x^2\right)\left(a+b\log(cx^n)\right)}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{2e^2\left(d^2-e^2x^2\right)\left(a+b\log(cx^n)\right)}{3d^4x\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right.}{\sqrt{d}}$$

$$= -\frac{\left(d^2-e^2x^2\right)\left(a+b\log(cx^n)\right)}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{2e^2\left(d^2-e^2x^2\right)\left(a+b\log(cx^n)\right)}{3d^4x\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right.}{3d^2\sqrt{}}$$

$$= -\frac{bn\left(d^2-e^2x^2\right)^2}{9d^4x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)\left(a+b\log(cx^n)\right)}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{2e^2\left(d^2-e^2x^2\right)\left(a+b\,\mathrm{l}\right.}{3d^4x\sqrt{d-ex}\sqrt{d-}}$$

$$= -\frac{2be^2n\left(d^2-e^2x^2\right)}{3d^4x\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn\left(d^2-e^2x^2\right)^2}{9d^4x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)\left(a+b\log(cx^n)\right)}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{2be^2n\left(d^2-e^2x^2\right)}{3d^4x\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn\left(d^2-e^2x^2\right)^2}{9d^4x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{2be^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{3d^3\sqrt{d-ex}\sqrt{d+ex}} -$$

Mathematica [A] time = 0.31, size = 116, normalized size = 0.46

$$-\frac{\sqrt{d-ex}\sqrt{d+ex}\left(3a\left(d^2+2e^2x^2\right)+3b\left(d^2+2e^2x^2\right)\log\left(cx^n\right)+bn\left(d^2+5e^2x^2\right)\right)+6be^3nx^3\tan^{-1}\left(\frac{ex}{\sqrt{d-ex}\sqrt{d+ex}}\right)}{9d^4x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] -1/9*(6*b*e^3*n*x^3*ArcTan[(e*x)/(Sqrt[d - e*x]*Sqrt[d + e*x])] + Sqrt[d -
e*x]*Sqrt[d + e*x]*(3*a*(d^2 + 2*e^2*x^2) + b*n*(d^2 + 5*e^2*x^2) + 3*b*(d^
2 + 2*e^2*x^2)*Log[c*x^n]))/(d^4*x^3)
```

fricas [A] time = 0.47, size = 135, normalized size = 0.54

$$\frac{12\,be^3nx^3\arctan\left(\frac{\sqrt{ex+d}\,\sqrt{-ex+d}-d}{ex}\right)-\left(bd^2n+3\,ad^2+\left(5\,be^2n+6\,ae^2\right)x^2+3\left(2\,be^2x^2+bd^2\right)\log(c)+3\left(2\,be^2nx^2+\cdots\right.\right.}{9\,d^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="f
ricas")
```

```
[Out] 1/9*(12*b*e^3*n*x^3*arctan((sqrt(e*x + d)*sqrt(-e*x + d) - d)/(e*x)) - (b*d
^2*n + 3*a*d^2 + (5*b*e^2*n + 6*a*e^2)*x^2 + 3*(2*b*e^2*x^2 + b*d^2)*log(c)
 + 3*(2*b*e^2*n*x^2 + b*d^2*n)*log(x))*sqrt(e*x + d)*sqrt(-e*x + d))/(d^4*x
^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\sqrt{ex+d}\,\sqrt{-ex+d}\,x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="g
iac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*sqrt(-e*x + d)*x^4), x)
```

maple [F] time = 0.55, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^n\right)+a}{\sqrt{-ex+d}\,\sqrt{ex+d}\,x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}a\left(\frac{2\sqrt{-e^2x^2+d^2}\,e^2}{d^4x}+\frac{\sqrt{-e^2x^2+d^2}}{d^2x^3}\right)+b\int \frac{\log(c)+\log\left(x^n\right)}{\sqrt{ex+d}\,\sqrt{-ex+d}\,x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="m
axima")
```

```
[Out] -1/3*a*(2*sqrt(-e^2*x^2 + d^2)*e^2/(d^4*x) + sqrt(-e^2*x^2 + d^2)/(d^2*x^3)
) + b*integrate((log(c) + log(x^n))/(sqrt(e*x + d)*sqrt(-e*x + d)*x^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b\,\ln\left(c\,x^n\right)}{x^4\,\sqrt{d+e\,x}\,\sqrt{d-e\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^4*(d + e*x)^(1/2)*(d - e*x)^(1/2)),x)
[Out] int((a + b*log(c*x^n))/(x^4*(d + e*x)^(1/2)*(d - e*x)^(1/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
[Out] Timed out
```

3.317 $\int \frac{x \log(x)}{\sqrt{-1+x^2}} \, dx$

Optimal. Leaf size=34

$$-\sqrt{x^2-1}+\sqrt{x^2-1}\log(x)+\tan^{-1}\left(\sqrt{x^2-1}\right)$$

```
[Out] arctan((x^2-1)^(1/2))-(x^2-1)^(1/2)+ln(x)*(x^2-1)^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.385$, Rules used = {2338, 266, 50, 63, 203}

$$-\sqrt{x^2-1}+\sqrt{x^2-1}\log(x)+\tan^{-1}\left(\sqrt{x^2-1}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(x*Log[x])/Sqrt[-1 + x^2],x]
```

```
[Out] -Sqrt[-1 + x^2] + ArcTan[Sqrt[-1 + x^2]] + Sqrt[-1 + x^2]*Log[x]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x\log(x)}{\sqrt{-1+x^2}}\,dx &= \sqrt{-1+x^2}\log(x) - \int \frac{\sqrt{-1+x^2}}{x}\,dx \\
&= \sqrt{-1+x^2}\log(x) - \frac{1}{2}\text{Subst}\left(\int \frac{\sqrt{-1+x}}{x}\,dx, x, x^2\right) \\
&= -\sqrt{-1+x^2} + \sqrt{-1+x^2}\log(x) + \frac{1}{2}\text{Subst}\left(\int \frac{1}{\sqrt{-1+x}\,x}\,dx, x, x^2\right) \\
&= -\sqrt{-1+x^2} + \sqrt{-1+x^2}\log(x) + \text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, \sqrt{-1+x^2}\right) \\
&= -\sqrt{-1+x^2} + \tan^{-1}\left(\sqrt{-1+x^2}\right) + \sqrt{-1+x^2}\log(x)
\end{aligned}
$$

Mathematica [A] time = 0.03, size = 27, normalized size = 0.79

$$\sqrt{x^2-1}\,(\log(x)-1) - \tan^{-1}\left(\frac{1}{\sqrt{x^2-1}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*Log[x])/Sqrt[-1 + x^2],x]
[Out] -ArcTan[1/Sqrt[-1 + x^2]] + Sqrt[-1 + x^2]*(-1 + Log[x])
```

fricas [A] time = 0.42, size = 27, normalized size = 0.79

$$\sqrt{x^2-1}\left(\log(x)-1\right) + 2\arctan\left(-x+\sqrt{x^2-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)/(x^2-1)^(1/2),x, algorithm="fricas")
[Out] sqrt(x^2 - 1)*(log(x) - 1) + 2*arctan(-x + sqrt(x^2 - 1))
```

giac [A] time = 0.34, size = 28, normalized size = 0.82

$$\sqrt{x^2-1}\log(x) - \sqrt{x^2-1} + \arctan\left(\sqrt{x^2-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)/(x^2-1)^(1/2),x, algorithm="giac")
[Out] sqrt(x^2 - 1)*log(x) - sqrt(x^2 - 1) + arctan(sqrt(x^2 - 1))
```

maple [C] time = 0.27, size = 119, normalized size = 3.50

$$\frac{\sqrt{-\text{signum}\left(x^2-1\right)}\left(2-2\sqrt{-x^2+1}\right)\ln(x)}{2\sqrt{\text{signum}\left(x^2-1\right)}} - \frac{\sqrt{-\text{signum}\left(x^2-1\right)}\left(2-2\sqrt{-x^2+1}\right)}{4\sqrt{\text{signum}\left(x^2-1\right)}} + \frac{\sqrt{-\text{signum}\left(x^2-1\right)}\ (}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*ln(x)/(x^2-1)^(1/2),x)
[Out] -1/4/signum(x^2-1)^(1/2)*(-signum(x^2-1))^(1/2)*(2-2*(-x^2+1)^(1/2))+1/2/si
gnum(x^2-1)^(1/2)*(-signum(x^2-1))^(1/2)*ln(x)*(2-2*(-x^2+1)^(1/2))+1/32/si
```

```
gnum(x^2-1)^(1/2)*(-signum(x^2-1))^(1/2)*(-16+16*(-x^2+1)^(1/2)-32*ln(1/2+1
/2*(-x^2+1)^(1/2)))
```

maxima [A] time = 1.29, size = 27, normalized size = 0.79

$$\sqrt{x^2-1}\log(x)-\sqrt{x^2-1}-\arcsin\left(\frac{1}{|x|}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)/(x^2-1)^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(x^2 - 1)*log(x) - sqrt(x^2 - 1) - arcsin(1/abs(x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x\ln(x)}{\sqrt{x^2-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*log(x))/(x^2 - 1)^(1/2),x)
```

```
[Out] int((x*log(x))/(x^2 - 1)^(1/2), x)
```

sympy [A] time = 2.68, size = 29, normalized size = 0.85

$$\sqrt{x^2-1}\log(x)-\begin{cases}\sqrt{x^2-1}-\operatorname{acos}\left(\frac{1}{x}\right) & \text{for } x>-1\wedge x<1\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*ln(x)/(x**2-1)**(1/2),x)
```

```
[Out] sqrt(x**2 - 1)*log(x) - Piecewise((sqrt(x**2 - 1) - acos(1/x), (x > -1) & (
x < 1)))
```

3.318 $\int (fx)^m \left(d+ex^2\right)^3 (a+b\log (cx^n)) \, dx$

Optimal. Leaf size=211

$$\frac{d^3(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{3d^2e(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}+\frac{3de^2(fx)^{m+5}(a+b\log(cx^n))}{f^5(m+5)}+\frac{e^3(fx)^{m+7}(a+b\log(cx^n))}{f^7(m+7)} \cdots$$

```
[Out] -b*d^3*n*(f*x)^(1+m)/f/(1+m)^2-3*b*d^2*e*n*(f*x)^(3+m)/f^3/(3+m)^2-3*b*d*e^
2*n*(f*x)^(5+m)/f^5/(5+m)^2-b*e^3*n*(f*x)^(7+m)/f^7/(7+m)^2+d^3*(f*x)^(1+m)
*(a+b*ln(c*x^n))/f/(1+m)+3*d^2*e*(f*x)^(3+m)*(a+b*ln(c*x^n))/f^3/(3+m)+3*d*
e^2*(f*x)^(5+m)*(a+b*ln(c*x^n))/f^5/(5+m)+e^3*(f*x)^(7+m)*(a+b*ln(c*x^n))/f
^7/(7+m)
```

Rubi [A] time = 1.68, antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {270, 2350, 14}

$$\frac{3d^2e(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}+\frac{d^3(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{3de^2(fx)^{m+5}(a+b\log(cx^n))}{f^5(m+5)}+\frac{e^3(fx)^{m+7}(a+b\log(cx^n))}{f^7(m+7)} \cdots$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d^3*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (3*b*d^2*e*n*(f*x)^(3 + m))/(f^3
*(3 + m)^2) - (3*b*d*e^2*n*(f*x)^(5 + m))/(f^5*(5 + m)^2) - (b*e^3*n*(f*x)^
(7 + m))/(f^7*(7 + m)^2) + (d^3*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m
)) + (3*d^2*e*(f*x)^(3 + m)*(a + b*Log[c*x^n]))/(f^3*(3 + m)) + (3*d*e^2*(f
*x)^(5 + m)*(a + b*Log[c*x^n]))/(f^5*(5 + m)) + (e^3*(f*x)^(7 + m)*(a + b*L
og[c*x^n]))/(f^7*(7 + m))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int (fx)^m \left(d+ex^2\right)^3 \left(a+b\log\left(cx^n\right)\right)\,dx = \frac{d^3(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{3d^2e(fx)^{3+m}\left(a+b\log\left(cx^n\right)\right)}{f^3(3+m)} + \frac{3de^2(f$$

$$= \frac{d^3(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{3d^2e(fx)^{3+m}\left(a+b\log\left(cx^n\right)\right)}{f^3(3+m)} + \frac{3de^2(f$$

$$= -\frac{bd^3n(fx)^{1+m}}{f(1+m)^2} - \frac{3bd^2en(fx)^{3+m}}{f^3(3+m)^2} - \frac{3bde^2n(fx)^{5+m}}{f^5(5+m)^2} - \frac{be^3n(fx)^{7+m}}{f^7(7+m)^2} + \frac{d}{}$$

Mathematica [**A**] time = 0.27, size = 156, normalized size = 0.74

$$x(fx)^m\left(\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{m+1} + \frac{3d^2ex^2\left(a+b\log\left(cx^n\right)\right)}{m+3} + \frac{3de^2x^4\left(a+b\log\left(cx^n\right)\right)}{m+5} + \frac{e^3x^6\left(a+b\log\left(cx^n\right)\right)}{m+7} - \frac{bc}{(m}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^3*n)/(1 + m)^2) - (3*b*d^2*e*n*x^2)/(3 + m)^2 - (3*b*d*e^
2*n*x^4)/(5 + m)^2 - (b*e^3*n*x^6)/(7 + m)^2 + (d^3*(a + b*Log[c*x^n]))/(1
+ m) + (3*d^2*e*x^2*(a + b*Log[c*x^n]))/(3 + m) + (3*d*e^2*x^4*(a + b*Log[c
*x^n]))/(5 + m) + (e^3*x^6*(a + b*Log[c*x^n]))/(7 + m))
```

fricas [**B**] time = 0.45, size = 1222, normalized size = 5.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e^3*m^7 + 25*a*e^3*m^6 + 253*a*e^3*m^5 + 1333*a*e^3*m^4 + 3907*a*e^3*m^
3 + 6283*a*e^3*m^2 + 5055*a*e^3*m + 1575*a*e^3 - (b*e^3*m^6 + 18*b*e^3*m^5
+ 127*b*e^3*m^4 + 444*b*e^3*m^3 + 799*b*e^3*m^2 + 690*b*e^3*m + 225*b*e^3)*
n)*x^7 + 3*(a*d*e^2*m^7 + 27*a*d*e^2*m^6 + 293*a*d*e^2*m^5 + 1639*a*d*e^2*m
^4 + 5043*a*d*e^2*m^3 + 8417*a*d*e^2*m^2 + 6951*a*d*e^2*m + 2205*a*d*e^2 -
(b*d*e^2*m^6 + 22*b*d*e^2*m^5 + 183*b*d*e^2*m^4 + 724*b*d*e^2*m^3 + 1423*b*
d*e^2*m^2 + 1302*b*d*e^2*m + 441*b*d*e^2)*n)*x^5 + 3*(a*d^2*e*m^7 + 29*a*d^
2*e*m^6 + 341*a*d^2*e*m^5 + 2081*a*d^2*e*m^4 + 6995*a*d^2*e*m^3 + 12647*a*d
^2*e*m^2 + 11095*a*d^2*e*m + 3675*a*d^2*e - (b*d^2*e*m^6 + 26*b*d^2*e*m^5 +
 263*b*d^2*e*m^4 + 1292*b*d^2*e*m^3 + 3119*b*d^2*e*m^2 + 3290*b*d^2*e*m + 1
225*b*d^2*e)*n)*x^3 + (a*d^3*m^7 + 31*a*d^3*m^6 + 397*a*d^3*m^5 + 2707*a*d^
3*m^4 + 10531*a*d^3*m^3 + 23101*a*d^3*m^2 + 25935*a*d^3*m + 11025*a*d^3 - (
b*d^3*m^6 + 30*b*d^3*m^5 + 367*b*d^3*m^4 + 2340*b*d^3*m^3 + 8191*b*d^3*m^2
+ 14910*b*d^3*m + 11025*b*d^3)*n)*x + ((b*e^3*m^7 + 25*b*e^3*m^6 + 253*b*e^
3*m^5 + 1333*b*e^3*m^4 + 3907*b*e^3*m^3 + 6283*b*e^3*m^2 + 5055*b*e^3*m + 1
575*b*e^3)*x^7 + 3*(b*d*e^2*m^7 + 27*b*d*e^2*m^6 + 293*b*d*e^2*m^5 + 1639*b
*d*e^2*m^4 + 5043*b*d*e^2*m^3 + 8417*b*d*e^2*m^2 + 6951*b*d*e^2*m + 2205*b*
d*e^2)*x^5 + 3*(b*d^2*e*m^7 + 29*b*d^2*e*m^6 + 341*b*d^2*e*m^5 + 2081*b*d^2
*e*m^4 + 6995*b*d^2*e*m^3 + 12647*b*d^2*e*m^2 + 11095*b*d^2*e*m + 3675*b*d^
2*e)*x^3 + (b*d^3*m^7 + 31*b*d^3*m^6 + 397*b*d^3*m^5 + 2707*b*d^3*m^4 + 105
31*b*d^3*m^3 + 23101*b*d^3*m^2 + 25935*b*d^3*m + 11025*b*d^3)*x)*log(c) + (
(b*e^3*m^7 + 25*b*e^3*m^6 + 253*b*e^3*m^5 + 1333*b*e^3*m^4 + 3907*b*e^3*m^3
 + 6283*b*e^3*m^2 + 5055*b*e^3*m + 1575*b*e^3)*n*x^7 + 3*(b*d*e^2*m^7 + 27*
b*d*e^2*m^6 + 293*b*d*e^2*m^5 + 1639*b*d*e^2*m^4 + 5043*b*d*e^2*m^3 + 8417*
b*d*e^2*m^2 + 6951*b*d*e^2*m + 2205*b*d*e^2)*n*x^5 + 3*(b*d^2*e*m^7 + 29*b*
d^2*e*m^6 + 341*b*d^2*e*m^5 + 2081*b*d^2*e*m^4 + 6995*b*d^2*e*m^3 + 12647*b
*d^2*e*m^2 + 11095*b*d^2*e*m + 3675*b*d^2*e)*n*x^3 + (b*d^3*m^7 + 31*b*d^3*
```

```
m^6 + 397*b*d^3*m^5 + 2707*b*d^3*m^4 + 10531*b*d^3*m^3 + 23101*b*d^3*m^2 +
25935*b*d^3*m + 11025*b*d^3)*n*x)*log(x))*e^(m*log(f) + m*log(x))/(m^8 + 32
*m^7 + 428*m^6 + 3104*m^5 + 13238*m^4 + 33632*m^3 + 49036*m^2 + 36960*m + 1
1025)
```

giac [B] time = 0.62, size = 553, normalized size = 2.62

$$\frac{bf^6f^mx^7x^me^3\log(c)}{f^6m+7f^6}+\frac{af^6f^mx^7x^me^3}{f^6m+7f^6}+\frac{3\,bdf^4f^mx^5x^me^2\log(c)}{f^4m+5f^4}+\frac{3\,adf^4f^mx^5x^me^2}{f^4m+5f^4}+\frac{bf^mmnx^7x^me^3\log(x)}{m^2+14\,m+49}+\frac{7\,bf}{m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^6*f^m*x^7*x^m*e^3*log(c)/(f^6*m + 7*f^6) + a*f^6*f^m*x^7*x^m*e^3/(f^6*m
 + 7*f^6) + 3*b*d*f^4*f^m*x^5*x^m*e^2*log(c)/(f^4*m + 5*f^4) + 3*a*d*f^4*f^
m*x^5*x^m*e^2/(f^4*m + 5*f^4) + b*f^m*m*n*x^7*x^m*e^3*log(x)/(m^2 + 14*m +
49) + 7*b*f^m*n*x^7*x^m*e^3*log(x)/(m^2 + 14*m + 49) + 3*b*d*f^m*m*n*x^5*x^
m*e^2*log(x)/(m^2 + 10*m + 25) - b*f^m*n*x^7*x^m*e^3/(m^2 + 14*m + 49) + 3*
b*d^2*f^2*f^m*x^3*x^m*e*log(c)/(f^2*m + 3*f^2) + 15*b*d*f^m*n*x^5*x^m*e^2*l
og(x)/(m^2 + 10*m + 25) + 3*b*d^2*f^m*m*n*x^3*x^m*e*log(x)/(m^2 + 6*m + 9)
- 3*b*d*f^m*n*x^5*x^m*e^2/(m^2 + 10*m + 25) + 3*a*d^2*f^2*f^m*x^3*x^m*e/(f^
2*m + 3*f^2) + 9*b*d^2*f^m*n*x^3*x^m*e*log(x)/(m^2 + 6*m + 9) - 3*b*d^2*f^m
*n*x^3*x^m*e/(m^2 + 6*m + 9) + b*d^3*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) +
 b*d^3*f^m*n*x*x^m*log(x)/(m^2 + 2*m + 1) - b*d^3*f^m*n*x*x^m/(m^2 + 2*m +
1) + (f*x)^m*b*d^3*x*log(c)/(m + 1) + (f*x)^m*a*d^3*x/(m + 1)
```

maple [C] time = 0.62, size = 5139, normalized size = 24.36

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] result too large to display
```

maxima [A] time = 0.83, size = 271, normalized size = 1.28

$$\frac{be^3f^mx^7x^m\log\left(cx^n\right)}{m+7}+\frac{ae^3f^mx^7x^m}{m+7}-\frac{be^3f^mnx^7x^m}{(m+7)^2}+\frac{3\,bde^2f^mx^5x^m\log\left(cx^n\right)}{m+5}+\frac{3\,ade^2f^mx^5x^m}{m+5}-\frac{3\,bde^2f^mnx^5x^m}{(m+5)^2}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] b*e^3*f^m*x^7*x^m*log(c*x^n)/(m + 7) + a*e^3*f^m*x^7*x^m/(m + 7) - b*e^3*f^
m*n*x^7*x^m/(m + 7)^2 + 3*b*d*e^2*f^m*x^5*x^m*log(c*x^n)/(m + 5) + 3*a*d*e^
2*f^m*x^5*x^m/(m + 5) - 3*b*d*e^2*f^m*n*x^5*x^m/(m + 5)^2 + 3*b*d^2*e*f^m*x
^3*x^m*log(c*x^n)/(m + 3) + 3*a*d^2*e*f^m*x^3*x^m/(m + 3) - 3*b*d^2*e*f^m*n
*x^3*x^m/(m + 3)^2 - b*d^3*f^m*n*x*x^m/(m + 1)^2 + (f*x)^(m + 1)*b*d^3*log(
c*x^n)/(f*(m + 1)) + (f*x)^(m + 1)*a*d^3/(f*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(f\,x\right)}^m\,{\left(e\,x^2+d\right)}^3\,\left(a+b\,\ln\left(c\,x^n\right)\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d + e*x^2)^3*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^m*(d + e*x^2)^3*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.319 $\int (fx)^m \left(d+ex^2\right)^2 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=153

$$\frac{d^2(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{2de(fx)^{m+3}\left(a+b\log\left(cx^n\right)\right)}{f^3(m+3)}+\frac{e^2(fx)^{m+5}\left(a+b\log\left(cx^n\right)\right)}{f^5(m+5)}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-\frac{2bden}{f^3(m}$$

```
[Out] -b*d^2*n*(f*x)^(1+m)/f/(1+m)^2-2*b*d*e*n*(f*x)^(3+m)/f^3/(3+m)^2-b*e^2*n*(f
*x)^(5+m)/f^5/(5+m)^2+d^2*(f*x)^(1+m)*(a+b*ln(c*x^n))/f/(1+m)+2*d*e*(f*x)^(
3+m)*(a+b*ln(c*x^n))/f^3/(3+m)+e^2*(f*x)^(5+m)*(a+b*ln(c*x^n))/f^5/(5+m)
```

Rubi [A] time = 0.18, antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {270, 2350, 12, 14}

$$\frac{d^2(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{2de(fx)^{m+3}\left(a+b\log\left(cx^n\right)\right)}{f^3(m+3)}+\frac{e^2(fx)^{m+5}\left(a+b\log\left(cx^n\right)\right)}{f^5(m+5)}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-\frac{2bden}{f^3(m}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d^2*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (2*b*d*e*n*(f*x)^(3 + m))/(f^3*(
3 + m)^2) - (b*e^2*n*(f*x)^(5 + m))/(f^5*(5 + m)^2) + (d^2*(f*x)^(1 + m)*(a
 + b*Log[c*x^n]))/(f*(1 + m)) + (2*d*e*(f*x)^(3 + m)*(a + b*Log[c*x^n]))/(f
^3*(3 + m)) + (e^2*(f*x)^(5 + m)*(a + b*Log[c*x^n]))/(f^5*(5 + m))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int (fx)^m \left(d+ex^2\right)^2 \left(a+b\log\left(cx^n\right)\right)\,dx = \frac{d^2(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{2de(fx)^{3+m}\left(a+b\log\left(cx^n\right)\right)}{f^3(3+m)} + \frac{e^2(fx)^{5+}}{}$$

$$= \frac{d^2(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{2de(fx)^{3+m}\left(a+b\log\left(cx^n\right)\right)}{f^3(3+m)} + \frac{e^2(fx)^{5+}}{}$$

$$= \frac{d^2(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{2de(fx)^{3+m}\left(a+b\log\left(cx^n\right)\right)}{f^3(3+m)} + \frac{e^2(fx)^{5+}}{}$$

$$= -\frac{bd^2n(fx)^{1+m}}{f(1+m)^2} - \frac{2bden(fx)^{3+m}}{f^3(3+m)^2} - \frac{be^2n(fx)^{5+m}}{f^5(5+m)^2} + \frac{d^2(fx)^{1+m}\left(a+b\log\right.}{f(1+m)}$$

Mathematica [A] time = 0.20, size = 112, normalized size = 0.73

$$x(fx)^m\left(\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{m+1} + \frac{2dex^2\left(a+b\log\left(cx^n\right)\right)}{m+3} + \frac{e^2x^4\left(a+b\log\left(cx^n\right)\right)}{m+5} - \frac{bd^2n}{(m+1)^2} - \frac{2bdenx^2}{(m+3)^2} - \frac{be^2nx^4}{(m+5)^2}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^2*n)/(1 + m)^2) - (2*b*d*e*n*x^2)/(3 + m)^2 - (b*e^2*n*x^
4)/(5 + m)^2 + (d^2*(a + b*Log[c*x^n]))/(1 + m) + (2*d*e*x^2*(a + b*Log[c*x
^n]))/(3 + m) + (e^2*x^4*(a + b*Log[c*x^n]))/(5 + m))
```

fricas [B] time = 0.43, size = 633, normalized size = 4.14

$$\frac{\left(\left(ae^2m^5 + 13\,ae^2m^4 + 62\,ae^2m^3 + 134\,ae^2m^2 + 129\,ae^2m + 45\,ae^2 - \left(be^2m^4 + 8\,be^2m^3 + 22\,be^2m^2 + 24\,be^2m + 9\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e^2*m^5 + 13*a*e^2*m^4 + 62*a*e^2*m^3 + 134*a*e^2*m^2 + 129*a*e^2*m + 4
5*a*e^2 - (b*e^2*m^4 + 8*b*e^2*m^3 + 22*b*e^2*m^2 + 24*b*e^2*m + 9*b*e^2)*n
)*x^5 + 2*(a*d*e*m^5 + 15*a*d*e*m^4 + 82*a*d*e*m^3 + 198*a*d*e*m^2 + 205*a*
d*e*m + 75*a*d*e - (b*d*e*m^4 + 12*b*d*e*m^3 + 46*b*d*e*m^2 + 60*b*d*e*m +
25*b*d*e)*n)*x^3 + (a*d^2*m^5 + 17*a*d^2*m^4 + 110*a*d^2*m^3 + 334*a*d^2*m^
2 + 465*a*d^2*m + 225*a*d^2 - (b*d^2*m^4 + 16*b*d^2*m^3 + 94*b*d^2*m^2 + 24
0*b*d^2*m + 225*b*d^2)*n)*x + ((b*e^2*m^5 + 13*b*e^2*m^4 + 62*b*e^2*m^3 + 1
34*b*e^2*m^2 + 129*b*e^2*m + 45*b*e^2)*x^5 + 2*(b*d*e*m^5 + 15*b*d*e*m^4 +
82*b*d*e*m^3 + 198*b*d*e*m^2 + 205*b*d*e*m + 75*b*d*e)*x^3 + (b*d^2*m^5 + 1
7*b*d^2*m^4 + 110*b*d^2*m^3 + 334*b*d^2*m^2 + 465*b*d^2*m + 225*b*d^2)*x)*l
og(c) + ((b*e^2*m^5 + 13*b*e^2*m^4 + 62*b*e^2*m^3 + 134*b*e^2*m^2 + 129*b*e
^2*m + 45*b*e^2)*n*x^5 + 2*(b*d*e*m^5 + 15*b*d*e*m^4 + 82*b*d*e*m^3 + 198*b
*d*e*m^2 + 205*b*d*e*m + 75*b*d*e)*n*x^3 + (b*d^2*m^5 + 17*b*d^2*m^4 + 110*
b*d^2*m^3 + 334*b*d^2*m^2 + 465*b*d^2*m + 225*b*d^2)*n*x)*log(x))*e^(m*log(
f) + m*log(x))/(m^6 + 18*m^5 + 127*m^4 + 444*m^3 + 799*m^2 + 690*m + 225)
```

giac [B] time = 0.42, size = 396, normalized size = 2.59

$$\frac{bf^4f^mx^5x^me^2\log(c)}{f^4m+5\,f^4} + \frac{af^4f^mx^5x^me^2}{f^4m+5\,f^4} + \frac{bf^mmnx^5x^me^2\log(x)}{m^2+10\,m+25} + \frac{2\,bdf^2f^mx^3x^me\log(c)}{f^2m+3\,f^2} + \frac{5\,bf^mnx^5x^me^2\log(x)}{m^2+10\,m+25} + \frac{2\,bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^4*f^m*x^5*x^m*e^2*log(c)/(f^4*m + 5*f^4) + a*f^4*f^m*x^5*x^m*e^2/(f^4*m
 + 5*f^4) + b*f^m*m*n*x^5*x^m*e^2*log(x)/(m^2 + 10*m + 25) + 2*b*d*f^2*f^m*
x^3*x^m*e*log(c)/(f^2*m + 3*f^2) + 5*b*f^m*n*x^5*x^m*e^2*log(x)/(m^2 + 10*m
 + 25) + 2*b*d*f^m*m*n*x^3*x^m*e*log(x)/(m^2 + 6*m + 9) - b*f^m*n*x^5*x^m*e
^2/(m^2 + 10*m + 25) + 2*a*d*f^2*f^m*x^3*x^m*e/(f^2*m + 3*f^2) + 6*b*d*f^m*
n*x^3*x^m*e*log(x)/(m^2 + 6*m + 9) - 2*b*d*f^m*n*x^3*x^m*e/(m^2 + 6*m + 9)
+ b*d^2*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*d^2*f^m*n*x*x^m*log(x)/(m^
2 + 2*m + 1) - b*d^2*f^m*n*x*x^m/(m^2 + 2*m + 1) + (f*x)^m*b*d^2*x*log(c)/(
m + 1) + (f*x)^m*a*d^2*x/(m + 1)
```

maple [C] time = 0.40, size = 2790, normalized size = 18.24

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] b*x*(e^2*m^2*x^4+4*e^2*m*x^4+2*d*e*m^2*x^2+3*e^2*x^4+12*d*e*m*x^2+d^2*m^2+1
0*d*e*x^2+8*d^2*m+15*d^2)/(m+1)/(m+3)/(m+5)*exp(1/2*(-I*Pi*csgn(I*f)*csgn(I
*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I
*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x))*m)*ln(x^n)+1/2*x*(2*a*e^2*m^5*x^4-188*b*
d^2*m^2*n-480*b*d^2*m*n+90*a*e^2*x^4+300*b*d*e*x^2*ln(c)-2*b*d^2*m^4*n+450*
a*d^2+26*a*e^2*m^4*x^4-32*b*d^2*m^3*n+220*a*d^2*m^3+668*a*d^2*m^2+930*a*d^2
*m-450*b*d^2*n+34*a*d^2*m^4+2*a*d^2*m^5+2*b*d^2*m^5*ln(c)+34*b*d^2*m^4*ln(c
)+220*b*d^2*m^3*ln(c)+668*b*d^2*m^2*ln(c)+930*b*d^2*m*ln(c)+90*b*e^2*x^4*ln
(c)+300*a*d*e*x^2+450*b*d^2*ln(c)+334*I*Pi*b*d^2*m^2*csgn(I*x^n)*csgn(I*c*x
^n)^2+334*I*Pi*b*d^2*m^2*csgn(I*c*x^n)^2*csgn(I*c)+465*I*Pi*b*d^2*m*csgn(I*
x^n)*csgn(I*c*x^n)^2-48*b*d*e*m^3*n*x^2+328*ln(c)*b*d*e*m^3*x^2+792*ln(c)*b
*d*e*m^2*x^2+820*ln(c)*b*d*e*m*x^2+60*ln(c)*b*d*e*m^4*x^2+4*ln(c)*b*d*e*m^5
*x^2-44*b*e^2*m^2*n*x^4-48*b*e^2*m*n*x^4-184*b*d*e*m^2*n*x^2-I*Pi*b*d^2*m^5
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e^2*m^5*x^4*csgn(I*c*x^n)^2*csg
n(I*c)+13*I*Pi*b*e^2*m^4*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+13*I*Pi*b*e^2*m^4*
x^4*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*d*e*m^5*x^2*csgn(I*c*x^n)^3-30*I*Pi*
b*d*e*m^4*x^2*csgn(I*c*x^n)^3-18*b*e^2*n*x^4-2*I*Pi*b*d*e*m^5*x^2*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-30*I*Pi*b*d*e*m^4*x^2*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)-4*b*d*e*m^4*n*x^2+2*I*Pi*b*d*e*m^5*x^2*csgn(I*x^n)*csgn(I*c*x^n)^
2+2*I*Pi*b*d*e*m^5*x^2*csgn(I*c*x^n)^2*csgn(I*c)+30*I*Pi*b*d*e*m^4*x^2*csgn
(I*x^n)*csgn(I*c*x^n)^2-62*I*Pi*b*e^2*m^3*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)+45*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+110*I*Pi*b*d^2*m^3*csgn(
I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d^2*m^5*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d^
2*m^5*csgn(I*c*x^n)^2*csgn(I*c)+328*a*d*e*m^3*x^2+792*a*d*e*m^2*x^2+820*a*d
*e*m*x^2+124*a*e^2*m^3*x^4+268*a*e^2*m^2*x^4+258*a*e^2*m*x^4+129*I*Pi*b*e^2
*m*x^4*csgn(I*c*x^n)^2*csgn(I*c)-396*I*Pi*b*d*e*m^2*x^2*csgn(I*c*x^n)^3-110
*I*Pi*b*d^2*m^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-410*I*Pi*b*d*e*m*x^2*cs
gn(I*c*x^n)^3-129*I*Pi*b*e^2*m*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+396*
I*Pi*b*d*e*m^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+396*I*Pi*b*d*e*m^2*x^2*csgn(
I*c*x^n)^2*csgn(I*c)-240*b*d*e*m*n*x^2-16*b*e^2*m^3*n*x^4+60*a*d*e*m^4*x^2+
30*I*Pi*b*d*e*m^4*x^2*csgn(I*c*x^n)^2*csgn(I*c)+410*I*Pi*b*d*e*m*x^2*csgn(I
*x^n)*csgn(I*c*x^n)^2+410*I*Pi*b*d*e*m*x^2*csgn(I*c*x^n)^2*csgn(I*c)-164*I*
Pi*b*d*e*m^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-396*I*Pi*b*d*e*m^2*x^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-410*I*Pi*b*d*e*m*x^2*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)+150*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+150*I*Pi*
b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*e^2*m^5*x^4*csgn(I*x^n)*csgn(I*c
*x^n)^2+164*I*Pi*b*d*e*m^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+164*I*Pi*b*d*e*m
^3*x^2*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*e^2*m^5*x^4*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)-13*I*Pi*b*e^2*m^4*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+124*
ln(c)*b*e^2*m^3*x^4+268*ln(c)*b*e^2*m^2*x^4+258*ln(c)*b*e^2*m*x^4+26*ln(c)*
b*e^2*m^4*x^4+2*ln(c)*b*e^2*m^5*x^4-2*b*e^2*m^4*n*x^4+4*a*d*e*m^5*x^2-225*I
```

```
*Pi*b*d^2*csgn(I*c*x^n)^3-334*I*Pi*b*d^2*m^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)-465*I*Pi*b*d^2*m*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+134*I*Pi*b*e^2*m
^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+134*I*Pi*b*e^2*m^2*x^4*csgn(I*c*x^n)^2*c
sgn(I*c)-17*I*Pi*b*d^2*m^4*csgn(I*c*x^n)^3+225*I*Pi*b*d^2*csgn(I*x^n)*csgn(
I*c*x^n)^2-150*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^3-I*Pi*b*d^2*m^5*csgn(I*c*x^n)^
3-134*I*Pi*b*e^2*m^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-150*I*Pi*b*d*e
*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-17*I*Pi*b*d^2*m^4*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)-45*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1
64*I*Pi*b*d*e*m^3*x^2*csgn(I*c*x^n)^3+129*I*Pi*b*e^2*m*x^4*csgn(I*x^n)*csgn
(I*c*x^n)^2-100*b*d*e*n*x^2-I*Pi*b*e^2*m^5*x^4*csgn(I*c*x^n)^3-13*I*Pi*b*e^
2*m^4*x^4*csgn(I*c*x^n)^3+17*I*Pi*b*d^2*m^4*csgn(I*x^n)*csgn(I*c*x^n)^2+17*
I*Pi*b*d^2*m^4*csgn(I*c*x^n)^2*csgn(I*c)+110*I*Pi*b*d^2*m^3*csgn(I*c*x^n)^2
*csgn(I*c)-62*I*Pi*b*e^2*m^3*x^4*csgn(I*c*x^n)^3+465*I*Pi*b*d^2*m*csgn(I*c*
x^n)^2*csgn(I*c)-225*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-129*I*P
i*b*e^2*m*x^4*csgn(I*c*x^n)^3+45*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2
-134*I*Pi*b*e^2*m^2*x^4*csgn(I*c*x^n)^3+225*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn
(I*c)-334*I*Pi*b*d^2*m^2*csgn(I*c*x^n)^3-465*I*Pi*b*d^2*m*csgn(I*c*x^n)^3-4
5*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3-110*I*Pi*b*d^2*m^3*csgn(I*c*x^n)^3+62*I*Pi
*b*e^2*m^3*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+62*I*Pi*b*e^2*m^3*x^4*csgn(I*c*x
^n)^2*csgn(I*c))/(m+5)^2/(m+1)^2/(m+3)^2*exp(1/2*(-I*Pi*csgn(I*f)*csgn(I*x)
*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi
*csgn(I*f*x)^3+2*ln(f)+2*ln(x))*m)
```

maxima [A] time = 0.85, size = 195, normalized size = 1.27

$$\frac{be^2f^mx^5x^m\log(cx^n)}{m+5}+\frac{ae^2f^mx^5x^m}{m+5}-\frac{be^2f^mnx^5x^m}{(m+5)^2}+\frac{2\,bdef^mx^3x^m\log(cx^n)}{m+3}+\frac{2\,adef^mx^3x^m}{m+3}-\frac{2\,bdef^mnx^3x^m}{(m+3)^2}-\frac{bd^2f^m}{(m+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] b*e^2*f^m*x^5*x^m*log(c*x^n)/(m + 5) + a*e^2*f^m*x^5*x^m/(m + 5) - b*e^2*f^
m*n*x^5*x^m/(m + 5)^2 + 2*b*d*e*f^m*x^3*x^m*log(c*x^n)/(m + 3) + 2*a*d*e*f^
m*x^3*x^m/(m + 3) - 2*b*d*e*f^m*n*x^3*x^m/(m + 3)^2 - b*d^2*f^m*n*x*x^m/(m
+ 1)^2 + (f*x)^(m + 1)*b*d^2*log(c*x^n)/(f*(m + 1)) + (f*x)^(m + 1)*a*d^2/(
f*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(f\,x\right)}^m\,{\left(e\,x^2+d\right)}^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d + e*x^2)^2*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^m*(d + e*x^2)^2*(a + b*log(c*x^n)), x)
```

sympy [A] time = 64.06, size = 3850, normalized size = 25.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise(((-a*d**2/(4*x**4) - a*d*e/x**2 + a*e**2*log(x) + b*d**2*(-n/(16*
x**4) - log(c*x**n)/(4*x**4)) + 2*b*d*e*(-n/(4*x**2) - log(c*x**n)/(2*x**2)
) - b*e**2*Piecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), Tr
ue)))/f**5, Eq(m, -5)), ((-a*d**2/(2*x**2) + 2*a*d*e*log(x) + a*e**2*x**2/2
 - b*d**2*n*log(x)/(2*x**2) - b*d**2*n/(4*x**2) - b*d**2*log(c)/(2*x**2) +
```

```
b*d*e*n*log(x)**2 + 2*b*d*e*log(c)*log(x) + b*e**2*n*x**2*log(x)/2 - b*e**2
*n*x**2/4 + b*e**2*x**2*log(c)/2)/f**3, Eq(m, -3)), ((a*d**2*log(x) + a*d*e
*x**2 + a*e**2*x**4/4 + b*d**2*n*log(x)**2/2 + b*d**2*log(c)*log(x) + b*d*e
*n*x**2*log(x) - b*d*e*n*x**2/2 + b*d*e*x**2*log(c) + b*e**2*n*x**4*log(x)/
4 - b*e**2*n*x**4/16 + b*e**2*x**4*log(c)/4)/f, Eq(m, -1)), (a*d**2*f**m*m*
*5*x*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) +
 17*a*d**2*f**m*m**4*x*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**
2 + 690*m + 225) + 110*a*d**2*f**m*m**3*x*x**m/(m**6 + 18*m**5 + 127*m**4 +
 444*m**3 + 799*m**2 + 690*m + 225) + 334*a*d**2*f**m*m**2*x*x**m/(m**6 + 1
8*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 465*a*d**2*f**m*m*
x*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 22
5*a*d**2*f**m*x*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690
*m + 225) + 2*a*d*e*f**m*m**5*x**3*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m*
*3 + 799*m**2 + 690*m + 225) + 30*a*d*e*f**m*m**4*x**3*x**m/(m**6 + 18*m**5
 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 164*a*d*e*f**m*m**3*x**3
*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 396
*a*d*e*f**m*m**2*x**3*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2
 + 690*m + 225) + 410*a*d*e*f**m*m*x**3*x**m/(m**6 + 18*m**5 + 127*m**4 + 4
44*m**3 + 799*m**2 + 690*m + 225) + 150*a*d*e*f**m*x**3*x**m/(m**6 + 18*m**
5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + a*e**2*f**m*m**5*x**5*x
**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 13*a*
e**2*f**m*m**4*x**5*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 +
 690*m + 225) + 62*a*e**2*f**m*m**3*x**5*x**m/(m**6 + 18*m**5 + 127*m**4 +
444*m**3 + 799*m**2 + 690*m + 225) + 134*a*e**2*f**m*m**2*x**5*x**m/(m**6 +
 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 129*a*e**2*f**m*
m*x**5*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225)
 + 45*a*e**2*f**m*x**5*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**
2 + 690*m + 225) + b*d**2*f**m*m**5*n*x*x**m*log(x)/(m**6 + 18*m**5 + 127*m
**4 + 444*m**3 + 799*m**2 + 690*m + 225) + b*d**2*f**m*m**5*x*x**m*log(c)/(
m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 17*b*d**2*
f**m*m**4*n*x*x**m*log(x)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2
+ 690*m + 225) - b*d**2*f**m*m**4*n*x*x**m/(m**6 + 18*m**5 + 127*m**4 + 444
*m**3 + 799*m**2 + 690*m + 225) + 17*b*d**2*f**m*m**4*x*x**m*log(c)/(m**6 +
 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 110*b*d**2*f**m*
m**3*n*x*x**m*log(x)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690
*m + 225) - 16*b*d**2*f**m*m**3*n*x*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m
**3 + 799*m**2 + 690*m + 225) + 110*b*d**2*f**m*m**3*x*x**m*log(c)/(m**6 +
18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 334*b*d**2*f**m*m
**2*n*x*x**m*log(x)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*
m + 225) - 94*b*d**2*f**m*m**2*n*x*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m*
*3 + 799*m**2 + 690*m + 225) + 334*b*d**2*f**m*m**2*x*x**m*log(c)/(m**6 + 1
8*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 465*b*d**2*f**m*m*
n*x*x**m*log(x)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m +
225) - 240*b*d**2*f**m*m*n*x*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 7
99*m**2 + 690*m + 225) + 465*b*d**2*f**m*m*x*x**m*log(c)/(m**6 + 18*m**5 +
127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 225*b*d**2*f**m*n*x*x**m*lo
g(x)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) - 225*
b*d**2*f**m*n*x*x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690
*m + 225) + 225*b*d**2*f**m*x*x**m*log(c)/(m**6 + 18*m**5 + 127*m**4 + 444*
m**3 + 799*m**2 + 690*m + 225) + 2*b*d*e*f**m*m**5*n*x**3*x**m*log(x)/(m**6
 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 2*b*d*e*f**m*m
**5*x**3*x**m*log(c)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690
*m + 225) + 30*b*d*e*f**m*m**4*n*x**3*x**m*log(x)/(m**6 + 18*m**5 + 127*m**
4 + 444*m**3 + 799*m**2 + 690*m + 225) - 2*b*d*e*f**m*m**4*n*x**3*x**m/(m**
6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 30*b*d*e*f**m
*m**4*x**3*x**m*log(c)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 6
90*m + 225) + 164*b*d*e*f**m*m**3*n*x**3*x**m*log(x)/(m**6 + 18*m**5 + 127*
m**4 + 444*m**3 + 799*m**2 + 690*m + 225) - 24*b*d*e*f**m*m**3*n*x**3*x**m/
(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 164*b*d*e
```

```
*f**m*m**3*x**3*x**m*log(c)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**
2 + 690*m + 225) + 396*b*d*e*f**m*m**2*n*x**3*x**m*log(x)/(m**6 + 18*m**5 +
 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) - 92*b*d*e*f**m*m**2*n*x**3*
x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 396*
b*d*e*f**m*m**2*x**3*x**m*log(c)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 79
9*m**2 + 690*m + 225) + 410*b*d*e*f**m*m*n*x**3*x**m*log(x)/(m**6 + 18*m**5
 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) - 120*b*d*e*f**m*m*n*x**3*
x**m/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 410*
b*d*e*f**m*m*x**3*x**m*log(c)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m
**2 + 690*m + 225) + 150*b*d*e*f**m*n*x**3*x**m*log(x)/(m**6 + 18*m**5 + 12
7*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) - 50*b*d*e*f**m*n*x**3*x**m/(m*
*6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 150*b*d*e*f*
*m*x**3*x**m*log(c)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*
m + 225) + b*e**2*f**m*m**5*n*x**5*x**m*log(x)/(m**6 + 18*m**5 + 127*m**4 +
 444*m**3 + 799*m**2 + 690*m + 225) + b*e**2*f**m*m**5*x**5*x**m*log(c)/(m*
*6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 13*b*e**2*f*
*m*m**4*n*x**5*x**m*log(x)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2
 + 690*m + 225) - b*e**2*f**m*m**4*n*x**5*x**m/(m**6 + 18*m**5 + 127*m**4 +
 444*m**3 + 799*m**2 + 690*m + 225) + 13*b*e**2*f**m*m**4*x**5*x**m*log(c)/
(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 62*b*e**2
*f**m*m**3*n*x**5*x**m*log(x)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m
**2 + 690*m + 225) - 8*b*e**2*f**m*m**3*n*x**5*x**m/(m**6 + 18*m**5 + 127*m
**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 62*b*e**2*f**m*m**3*x**5*x**m*lo
g(c)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 134*
b*e**2*f**m*m**2*n*x**5*x**m*log(x)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 +
 799*m**2 + 690*m + 225) - 22*b*e**2*f**m*m**2*n*x**5*x**m/(m**6 + 18*m**5
+ 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 134*b*e**2*f**m*m**2*x**5
*x**m*log(c)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225
) + 129*b*e**2*f**m*m*n*x**5*x**m*log(x)/(m**6 + 18*m**5 + 127*m**4 + 444*m
**3 + 799*m**2 + 690*m + 225) - 24*b*e**2*f**m*m*n*x**5*x**m/(m**6 + 18*m**
5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 129*b*e**2*f**m*m*x**5*
x**m*log(c)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225)
 + 45*b*e**2*f**m*n*x**5*x**m*log(x)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3
+ 799*m**2 + 690*m + 225) - 9*b*e**2*f**m*n*x**5*x**m/(m**6 + 18*m**5 + 127
*m**4 + 444*m**3 + 799*m**2 + 690*m + 225) + 45*b*e**2*f**m*x**5*x**m*log(c
)/(m**6 + 18*m**5 + 127*m**4 + 444*m**3 + 799*m**2 + 690*m + 225), True))
```

3.320 $\int (fx)^m \left(d+ex^2\right) \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=95

$$\frac{d(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{e(fx)^{m+3}\left(a+b\log\left(cx^n\right)\right)}{f^3(m+3)}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{ben(fx)^{m+3}}{f^3(m+3)^2}$$

```
[Out] -b*d*n*(f*x)^(1+m)/f/(1+m)^2-b*e*n*(f*x)^(3+m)/f^3/(3+m)^2+d*(f*x)^(1+m)*(a
+b*ln(c*x^n))/f/(1+m)+e*(f*x)^(3+m)*(a+b*ln(c*x^n))/f^3/(3+m)
```

Rubi [A] time = 0.09, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {14, 2350}

$$\frac{d(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{e(fx)^{m+3}\left(a+b\log\left(cx^n\right)\right)}{f^3(m+3)}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{ben(fx)^{m+3}}{f^3(m+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (b*e*n*(f*x)^(3 + m))/(f^3*(3 + m)
^2) + (d*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m)) + (e*(f*x)^(3 + m)*(
a + b*Log[c*x^n]))/(f^3*(3 + m))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\begin{aligned}\int (fx)^m\left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)dx &= \frac{d(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}+\frac{e(fx)^{3+m}\left(a+b\log\left(cx^n\right)\right)}{f^3(3+m)}-(bn)\int (fx\\ &= \frac{d(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}+\frac{e(fx)^{3+m}\left(a+b\log\left(cx^n\right)\right)}{f^3(3+m)}-(bn)\int \Bigg(\frac{d}{1}\\ &= -\frac{bdn(fx)^{1+m}}{f(1+m)^2}-\frac{ben(fx)^{3+m}}{f^3(3+m)^2}+\frac{d(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}+\frac{e(fx)^{3+}}{}\end{aligned}$$

Mathematica [A] time = 0.08, size = 68, normalized size = 0.72

$$x(fx)^m\left(\frac{d\left(a+b\log\left(cx^n\right)\right)}{m+1}+\frac{ex^2\left(a+b\log\left(cx^n\right)\right)}{m+3}-\frac{bdn}{(m+1)^2}-\frac{benx^2}{(m+3)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d*n)/(1 + m)^2) - (b*e*n*x^2)/(3 + m)^2 + (d*(a + b*Log[c*x
^n]))/(1 + m) + (e*x^2*(a + b*Log[c*x^n]))/(3 + m))
```

fricas [B] time = 0.41, size = 235, normalized size = 2.47

$$\big(\big(aem^3 + 5\,aem^2 + 7\,aem + 3\,ae - \big(bem^2 + 2\,bem + be\big)n\big)x^3 + \big(adm^3 + 7\,adm^2 + 15\,adm + 9\,ad - \big(bdm^2 + 6\,bdm$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e*m^3 + 5*a*e*m^2 + 7*a*e*m + 3*a*e - (b*e*m^2 + 2*b*e*m + b*e)*n)*x^3
+ (a*d*m^3 + 7*a*d*m^2 + 15*a*d*m + 9*a*d - (b*d*m^2 + 6*b*d*m + 9*b*d)*n)*
x + ((b*e*m^3 + 5*b*e*m^2 + 7*b*e*m + 3*b*e)*x^3 + (b*d*m^3 + 7*b*d*m^2 + 1
5*b*d*m + 9*b*d)*x)*log(c) + ((b*e*m^3 + 5*b*e*m^2 + 7*b*e*m + 3*b*e)*n*x^3
 + (b*d*m^3 + 7*b*d*m^2 + 15*b*d*m + 9*b*d)*n*x)*log(x))*e^(m*log(f) + m*lo
g(x))/(m^4 + 8*m^3 + 22*m^2 + 24*m + 9)
```

giac [B] time = 0.39, size = 239, normalized size = 2.52

$$\frac{bf^2f^mx^3x^me\log(c)}{f^2m+3\,f^2}+\frac{bf^mmnx^3x^me\log(x)}{m^2+6\,m+9}+\frac{af^2f^mx^3x^me}{f^2m+3\,f^2}+\frac{3\,bf^mnx^3x^me\log(x)}{m^2+6\,m+9}-\frac{bf^mnx^3x^me}{m^2+6\,m+9}+\frac{bdf^mmnxx^m\log}{m^2+2\,m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^2*f^m*x^3*x^m*e*log(c)/(f^2*m + 3*f^2) + b*f^m*m*n*x^3*x^m*e*log(x)/(m^
2 + 6*m + 9) + a*f^2*f^m*x^3*x^m*e/(f^2*m + 3*f^2) + 3*b*f^m*n*x^3*x^m*e*lo
g(x)/(m^2 + 6*m + 9) - b*f^m*n*x^3*x^m*e/(m^2 + 6*m + 9) + b*d*f^m*m*n*x*x^
m*log(x)/(m^2 + 2*m + 1) + b*d*f^m*n*x*x^m*log(x)/(m^2 + 2*m + 1) - b*d*f^m
*n*x*x^m/(m^2 + 2*m + 1) + (f*x)^m*b*d*x*log(c)/(m + 1) + (f*x)^m*a*d*x/(m
+ 1)
```

maple [C] time = 0.25, size = 1180, normalized size = 12.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] b*x*(e*m*x^2+e*x^2+d*m+3*d)/(m+1)/(m+3)*exp(1/2*(-I*Pi*csgn(I*f)*csgn(I*x)*
csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*
csgn(I*f*x)^3+2*ln(f)+2*ln(x))*m)*ln(x^n)-1/2*x*(18*b*d*n-30*a*d*m-6*a*e*x^
2-14*a*e*m*x^2-2*b*d*m^3*ln(c)-14*b*d*m^2*ln(c)-30*b*d*m*ln(c)-14*a*d*m^2-2
*a*e*m^3*x^2-6*b*e*x^2*ln(c)-18*a*d+2*b*d*m^2*n-2*a*d*m^3-18*b*d*ln(c)+3*I*
Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+15*I*Pi*b*d*m*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-7*I*Pi*b*e*m*x^2*csgn(I*c*x^n)^2*csgn(I*c)-5*I*Pi*b*e
*m^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-10*a*e*m^2*x^2+15*I*Pi*b*d*m*csgn(I*c*
x^n)^3-9*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-9*I*Pi*b*d*csgn(I*c*x^n)^2*cs
gn(I*c)+7*I*Pi*b*d*m^2*csgn(I*c*x^n)^3+3*I*Pi*b*e*x^2*csgn(I*c*x^n)^3+I*Pi*
b*d*m^3*csgn(I*c*x^n)^3+2*b*e*n*x^2+12*b*d*m*n+2*b*e*m^2*n*x^2+9*I*Pi*b*d*c
sgn(I*c*x^n)^3-7*I*Pi*b*d*m^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*e*m^3*x^2*
csgn(I*c*x^n)^3-3*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+5*I*Pi*b*e*m^2*x
^2*csgn(I*c*x^n)^3+7*I*Pi*b*e*m*x^2*csgn(I*c*x^n)^3+7*I*Pi*b*e*m*x^2*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)+5*I*Pi*b*e*m^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+I*Pi*b*e*m^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-10*ln(c)*b*e
*m^2*x^2-14*ln(c)*b*e*m*x^2-2*ln(c)*b*e*m^3*x^2-I*Pi*b*d*m^3*csgn(I*x^n)*cs
```

```
gn(I*c*x^n)^2-I*Pi*b*d*m^3*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d*m^3*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+7*I*Pi*b*d*m^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)-5*I*Pi*b*e*m^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-7*I*Pi*b*e*m*x^2*csgn(I*x^n
)*csgn(I*c*x^n)^2-I*Pi*b*e*m^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*e*m^3
*x^2*csgn(I*c*x^n)^2*csgn(I*c)+4*b*e*m*n*x^2-15*I*Pi*b*d*m*csgn(I*c*x^n)^2*
csgn(I*c)+9*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-7*I*Pi*b*d*m^2*csg
n(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)-15*I*Pi*b*d
*m*csgn(I*x^n)*csgn(I*c*x^n)^2)/(m+3)^2/(m+1)^2*exp(1/2*(-I*Pi*csgn(I*f)*cs
gn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)
^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x))*m)
```

maxima [A] time = 1.12, size = 119, normalized size = 1.25

$$\frac{bef^m x^3 x^m \log(cx^n)}{m+3} + \frac{aef^m x^3 x^m}{m+3} - \frac{bef^m n x^3 x^m}{(m+3)^2} - \frac{bdf^m n x x^m}{(m+1)^2} + \frac{(fx)^{m+1} bd \log(cx^n)}{f(m+1)} + \frac{(fx)^{m+1} ad}{f(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] b*e*f^m*x^3*x^m*log(c*x^n)/(m + 3) + a*e*f^m*x^3*x^m/(m + 3) - b*e*f^m*n*x^
3*x^m/(m + 3)^2 - b*d*f^m*n*x*x^m/(m + 1)^2 + (f*x)^(m + 1)*b*d*log(c*x^n)/
(f*(m + 1)) + (f*x)^(m + 1)*a*d/(f*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (f\,x)^m\,\left(e\,x^2+d\right)\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d + e*x^2)*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^m*(d + e*x^2)*(a + b*log(c*x^n)), x)
```

sympy [A] time = 15.80, size = 1261, normalized size = 13.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise(((-a*d/(2*x**2) + a*e*log(x) + b*d*(-n/(4*x**2) - log(c*x**n)/(2*
x**2)) - b*e*Piecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n),
True)))/f**3, Eq(m, -3)), ((a*d*log(x) + a*e*x**2/2 + b*d*n*log(x)**2/2 + b
*d*log(c)*log(x) + b*e*n*x**2*log(x)/2 - b*e*n*x**2/4 + b*e*x**2*log(c)/2)/
f, Eq(m, -1)), (a*d*f**m*m**3*x*x**m/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) +
 7*a*d*f**m*m**2*x*x**m/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + 15*a*d*f**m*
m*x*x**m/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + 9*a*d*f**m*x*x**m/(m**4 + 8
*m**3 + 22*m**2 + 24*m + 9) + a*e*f**m*m**3*x**3*x**m/(m**4 + 8*m**3 + 22*m
**2 + 24*m + 9) + 5*a*e*f**m*m**2*x**3*x**m/(m**4 + 8*m**3 + 22*m**2 + 24*m
 + 9) + 7*a*e*f**m*m*x**3*x**m/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + 3*a*e
*f**m*x**3*x**m/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + b*d*f**m*m**3*n*x*x*
*m*log(x)/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + b*d*f**m*m**3*x*x**m*log(c
)/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + 7*b*d*f**m*m**2*n*x*x**m*log(x)/(m
**4 + 8*m**3 + 22*m**2 + 24*m + 9) - b*d*f**m*m**2*n*x*x**m/(m**4 + 8*m**3
+ 22*m**2 + 24*m + 9) + 7*b*d*f**m*m**2*x*x**m*log(c)/(m**4 + 8*m**3 + 22*m
**2 + 24*m + 9) + 15*b*d*f**m*m*n*x*x**m*log(x)/(m**4 + 8*m**3 + 22*m**2 +
24*m + 9) - 6*b*d*f**m*m*n*x*x**m/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + 15
*b*d*f**m*m*x*x**m*log(c)/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + 9*b*d*f**m
*n*x*x**m*log(x)/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) - 9*b*d*f**m*n*x*x**m
```

```
/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + 9*b*d*f**m*x*x**m*log(c)/(m**4 + 8*
m**3 + 22*m**2 + 24*m + 9) + b*e*f**m*m**3*n*x**3*x**m*log(x)/(m**4 + 8*m**
3 + 22*m**2 + 24*m + 9) + b*e*f**m*m**3*x**3*x**m*log(c)/(m**4 + 8*m**3 + 2
2*m**2 + 24*m + 9) + 5*b*e*f**m*m**2*n*x**3*x**m*log(x)/(m**4 + 8*m**3 + 22
*m**2 + 24*m + 9) - b*e*f**m*m**2*n*x**3*x**m/(m**4 + 8*m**3 + 22*m**2 + 24
*m + 9) + 5*b*e*f**m*m**2*x**3*x**m*log(c)/(m**4 + 8*m**3 + 22*m**2 + 24*m
+ 9) + 7*b*e*f**m*m*n*x**3*x**m*log(x)/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9)
 - 2*b*e*f**m*m*n*x**3*x**m/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + 7*b*e*f*
*m*m*x**3*x**m*log(c)/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + 3*b*e*f**m*n*x
**3*x**m*log(x)/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) - b*e*f**m*n*x**3*x**m
/(m**4 + 8*m**3 + 22*m**2 + 24*m + 9) + 3*b*e*f**m*x**3*x**m*log(c)/(m**4 +
 8*m**3 + 22*m**2 + 24*m + 9), True))
```

3.321 $\int (fx)^m \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=46

$$\frac{(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}-\frac{bn(fx)^{m+1}}{f(m+1)^2}$$

```
[Out] -b*n*(f*x)^(1+m)/f/(1+m)^2+(f*x)^(1+m)*(a+b*ln(c*x^n))/f/(1+m)
```

Rubi [A] time = 0.02, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {2304}

$$\frac{(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}-\frac{bn(fx)^{m+1}}{f(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*(f*x)^(1 + m))/(f*(1 + m)^2)) + ((f*x)^(1 + m)*(a + b*Log[c*x^n]))/(
f*(1 + m))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int (fx)^m\left(a+b\log\left(cx^n\right)\right)\,dx=-\frac{bn(fx)^{1+m}}{f(1+m)^2}+\frac{(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 0.70

$$\frac{x(fx)^m\left(am+a+b(m+1)\log\left(cx^n\right)-bn\right)}{(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] (x*(f*x)^m*(a + a*m - b*n + b*(1 + m)*Log[c*x^n]))/(1 + m)^2
```

fricas [A] time = 0.41, size = 52, normalized size = 1.13

$$\frac{\left((bm+b)nx\log(x)+(bm+b)x\log(c)+(am-bn+a)x\right)e^{\left(m\log(f)+m\log(x)\right)}}{m^2+2m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((b*m + b)*n*x*log(x) + (b*m + b)*x*log(c) + (a*m - b*n + a)*x)*e^(m*log(f)
 + m*log(x))/(m^2 + 2*m + 1)
```

giac [B] time = 0.36, size = 95, normalized size = 2.07

$$\frac{bf^m mnxx^m \log(x)}{m^2+2m+1}+\frac{bf^m nxx^m \log(x)}{m^2+2m+1}-\frac{bf^m nxx^m}{m^2+2m+1}+\frac{(fx)^m bx\log(c)}{m+1}+\frac{(fx)^m ax}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*n*x*x^m*log(x)/(m^2 + 2*m +
1) - b*f^m*n*x*x^m/(m^2 + 2*m + 1) + (f*x)^m*b*x*log(c)/(m + 1) + (f*x)^m*a
*x/(m + 1)
```

maple [C] time = 0.07, size = 371, normalized size = 8.07

$$\frac{bx\,\mathrm{e}^{\frac{\left(-i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ix)\mathrm{csgn}(ifx)+i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ifx)^2+i\pi\,\mathrm{csgn}(ix)\mathrm{csgn}(ifx)^2-i\pi\mathrm{csgn}(ifx)^3+2\ln(f)+2\ln(x)\right)m}{2}}\ln(x^n)}{m+1}-\frac{\left(i\pi bm\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{c}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a),x)
```

```
[Out] b/(m+1)*x*exp(1/2*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csg
n(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x))
*m)*ln(x^n)-1/2*(I*Pi*b*m*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-I*Pi*b*m*csgn
(I*c)*csgn(I*c*x^n)^2-I*Pi*b*m*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*m*csgn(I*
c*x^n)^3+I*Pi*b*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-I*Pi*b*csgn(I*c)*csgn(I
*c*x^n)^2-I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*csgn(I*c*x^n)^3-2*b*m*l
n(c)-2*a*m+2*b*n-2*b*ln(c)-2*a)/(m+1)^2*x*exp(1/2*(-I*Pi*csgn(I*f)*csgn(I*x
)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*P
i*csgn(I*f*x)^3+2*ln(f)+2*ln(x))*m)
```

maxima [A] time = 1.02, size = 57, normalized size = 1.24

$$-\frac{bf^m nxx^m}{(m+1)^2}+\frac{(fx)^{m+1}b\log(cx^n)}{f(m+1)}+\frac{(fx)^{m+1}a}{f(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -b*f^m*n*x*x^m/(m + 1)^2 + (f*x)^(m + 1)*b*log(c*x^n)/(f*(m + 1)) + (f*x)^(
m + 1)*a/(f*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int (f\,x)^m\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^m*(a + b*log(c*x^n)), x)
```

<u>**sympy**</u> **[A]** time = 9.89, size = 192, normalized size = 4.17

$$\begin{cases} \frac{af^m mxx^m}{m^2+2m+1} + \frac{af^m xx^m}{m^2+2m+1} + \frac{bf^m mnxx^m \log(x)}{m^2+2m+1} + \frac{bf^m mxx^m \log(c)}{m^2+2m+1} + \frac{bf^m nxx^m \log(x)}{m^2+2m+1} - \frac{bf^m nxx^m}{m^2+2m+1} + \frac{bf^m xx^m \log(c)}{m^2+2m+1} & \text{for } m \neq -1 \\ \frac{\begin{cases} a\log(x) & \text{for } b = 0 \\ -\left(-a - b\log(c)\right)\log(x) & \text{for } n = 0 \\ \frac{\left(-a-b\log(cx^n)\right)^2}{2bn} & \text{otherwise} \end{cases}}{f} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((a*f**m*m*x*x**m/(m**2 + 2*m + 1) + a*f**m*x*x**m/(m**2 + 2*m + 1
) + b*f**m*m*n*x*x**m*log(x)/(m**2 + 2*m + 1) + b*f**m*m*x*x**m*log(c)/(m**
2 + 2*m + 1) + b*f**m*n*x*x**m*log(x)/(m**2 + 2*m + 1) - b*f**m*n*x*x**m/(m
**2 + 2*m + 1) + b*f**m*x*x**m*log(c)/(m**2 + 2*m + 1), Ne(m, -1)), (Piecew
ise((a*log(x), Eq(b, 0)), (-(-a - b*log(c))*log(x), Eq(n, 0)), ((-a - b*log
(c*x**n))**2/(2*b*n), True))/f, True))
```

3.322 $\int \frac{(fx)^m(a+b\log(cx^n))}{d+ex^2}\,dx$

Optimal. Leaf size=28

$$\text{Int}\left(\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^2},x\right)$$

```
[Out] Unintegrable((f*x)^m*(a+b*ln(c*x^n))/(e*x^2+d),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2),x]
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2), x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx=\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^2}\,dx$$

Mathematica [A] time = 0.21, size = 108, normalized size = 3.86

$$\frac{x(fx)^m\left((m+1)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\,{}_3F_2\left(1,\frac{m}{2}+\frac{1}{2},\frac{m}{2}+\frac{1}{2};\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};-\frac{ex^2}{d}\right)\right)}{d(m+1)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2),x]
[Out] (x*(f*x)^m*(-(b*n*HypergeometricPFQ[{1, 1/2 + m/2, 1/2 + m/2}, {3/2 + m/2,
3/2 + m/2}, -((e*x^2)/d)]) + (1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m
)/2, -((e*x^2)/d)]*(a + b*Log[c*x^n])))/(d*(1 + m)^2)
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(fx\right)^m b\log\left(cx^n\right)+\left(fx\right)^m a}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e*x^2 + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)\left(fx\right)^m}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^2 + d), x)
```

maple [A] time = 0.70, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^{n})+a)\left(fx\right)^{m}}{e\,x^{2}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x^2+d),x)
[Out] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x^2+d),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log(cx^{n})+a\right)\left(fx\right)^{m}}{ex^{2}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^2 + d), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(f\,x\right)^{m}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{e\,x^{2}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x^2),x)
[Out] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(fx\right)^{m}\left(a+b\log\left(cx^{n}\right)\right)}{d+ex^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))/(e*x**2+d),x)
[Out] Integral((f*x)**m*(a + b*log(c*x**n))/(d + e*x**2), x)
```

3.323 $\int \frac{(fx)^m(a+b\log(cx^n))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=28

$$\text{Int}\left(\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2},x\right)$$

```
[Out] Unintegrable((f*x)^m*(a+b*ln(c*x^n))/(e*x^2+d)^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2)^2, x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}\,dx=\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}\,dx$$

Mathematica [A] time = 0.13, size = 108, normalized size = 3.86

$$\frac{x(fx)^m\left((m+1)\,{}_2F_1\left(2,\frac{m+1}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\,{}_3F_2\left(2,\frac{m}{2}+\frac{1}{2},\frac{m}{2}+\frac{1}{2};\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};-\frac{ex^2}{d}\right)\right)}{d^2(m+1)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (x*(f*x)^m*(-(b*n*HypergeometricPFQ[{2, 1/2 + m/2, 1/2 + m/2}, {3/2 + m/2,
3/2 + m/2}, -((e*x^2)/d)]) + (1 + m)*Hypergeometric2F1[2, (1 + m)/2, (3 + m
)/2, -((e*x^2)/d)]*(a + b*Log[c*x^n])))/(d^2*(1 + m)^2)
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(fx\right)^m b\log\left(cx^n\right)+\left(fx\right)^m a}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)\left(fx\right)^m}{\left(ex^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^2 + d)^2, x)
```

maple [A] time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{\left(b \ln \left(c\,x^{n}\right)+a\right) \left(f x\right)^{m}}{\left(e\,x^{2}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x^2+d)^2,x)
[Out] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x^2+d)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log \left(cx^{n}\right)+a\right) \left(fx\right)^{m}}{\left(ex^{2}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^2 + d)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(f\,x\right)^{m}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{\left(e\,x^{2}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x^2)^2,x)
[Out] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x^2)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
[Out] Timed out
```

3.324 $\int \frac{\left(a+b\log(cx^n)\right)^3}{\left(d+ex^3\right)^2}\,dx$

Optimal. Leaf size=1198

$$\frac{2b^3\text{Li}_3\left(-\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^3}{3d^{5/3}\sqrt[3]{e}}-\frac{6\sqrt[3]{-1}\,b^3\text{Li}_3\left(\frac{\sqrt[3]{-1}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^3}{\left(1+\sqrt[3]{-1}\right)^4 d^{5/3}\sqrt[3]{e}}-\frac{2\sqrt[3]{-1}\,b^3\text{Li}_3\left(-\frac{(-1)^{2/3}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^3}{3d^{5/3}\sqrt[3]{e}}+\frac{4b^3\text{Li}_4\left(-\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^3}{3d^{5/3}\sqrt[3]{e}}-\frac{12i\sqrt{3}\,b^3\text{Li}_4\left(\frac{\sqrt[3]{-}\cdots}{}\right.}{\left(1+\sqrt[3]{-1}\right)^5 d\cdots}$$

```
[Out] 1/9*x*(a+b*ln(c*x^n))^3/d^(5/3)/(d^(1/3)+e^(1/3)*x)-(-1)^(1/3)*x*(a+b*ln(c*
x^n))^3/(1+(-1)^(1/3))^4/d^(5/3)/((-1)^(2/3)*d^(1/3)+e^(1/3)*x)+1/9*x*(a+b*
ln(c*x^n))^3/d^(5/3)/(d^(1/3)+(-1)^(2/3)*e^(1/3)*x)-1/3*b*n*(a+b*ln(c*x^n))
^2*ln(1+e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)+2/9*(a+b*ln(c*x^n))^3*ln(1+e^(1/
3)*x/d^(1/3))/d^(5/3)/e^(1/3)+3*(-1)^(1/3)*b*n*(a+b*ln(c*x^n))^2*ln(1-(-1)^
(1/3)*e^(1/3)*x/d^(1/3))/(1+(-1)^(1/3))^4/d^(5/3)/e^(1/3)+1/3*(-1)^(1/3)*b*
n*(a+b*ln(c*x^n))^2*ln(1+(-1)^(2/3)*e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)-2/3*
b^2*n^2*(a+b*ln(c*x^n))*polylog(2,-e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)+2/3*b
*n*(a+b*ln(c*x^n))^2*polylog(2,-e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)+6*(-1)^(
1/3)*b^2*n^2*(a+b*ln(c*x^n))*polylog(2,(-1)^(1/3)*e^(1/3)*x/d^(1/3))/(1+(-1
)^(1/3))^4/d^(5/3)/e^(1/3)+2/3*(-1)^(1/3)*b^2*n^2*(a+b*ln(c*x^n))*polylog(2
,-(-1)^(2/3)*e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)+2/3*b^3*n^3*polylog(3,-e^(1
/3)*x/d^(1/3))/d^(5/3)/e^(1/3)-4/3*b^2*n^2*(a+b*ln(c*x^n))*polylog(3,-e^(1/
3)*x/d^(1/3))/d^(5/3)/e^(1/3)-6*(-1)^(1/3)*b^3*n^3*polylog(3,(-1)^(1/3)*e^(
1/3)*x/d^(1/3))/(1+(-1)^(1/3))^4/d^(5/3)/e^(1/3)-2/3*(-1)^(1/3)*b^3*n^3*pol
ylog(3,-(-1)^(2/3)*e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)+4/3*b^3*n^3*polylog(4
,-e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)-4/9*(a+b*ln(c*x^n))^3*ln(1-1/2*e^(1/3)
*x*(1-I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1/3)/(1-I*3^(1/2))-4/3*b*n*(a+b*ln(c*x
^n))^2*polylog(2,1/2*e^(1/3)*x*(1-I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1/3)/(1-I*
3^(1/2))+8/3*b^2*n^2*(a+b*ln(c*x^n))*polylog(3,1/2*e^(1/3)*x*(1-I*3^(1/2))/
d^(1/3))/d^(5/3)/e^(1/3)/(1-I*3^(1/2))-8/3*b^3*n^3*polylog(4,1/2*e^(1/3)*x*
(1-I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1/3)/(1-I*3^(1/2))-4/9*(a+b*ln(c*x^n))^3*
ln(1-1/2*e^(1/3)*x*(1+I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1/3)/(1+I*3^(1/2))-4/3
*b*n*(a+b*ln(c*x^n))^2*polylog(2,1/2*e^(1/3)*x*(1+I*3^(1/2))/d^(1/3))/d^(5/
3)/e^(1/3)/(1+I*3^(1/2))+8/3*b^2*n^2*(a+b*ln(c*x^n))*polylog(3,1/2*e^(1/3)*
x*(1+I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1/3)/(1+I*3^(1/2))-8/3*b^3*n^3*polylog(
4,1/2*e^(1/3)*x*(1+I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1/3)/(1+I*3^(1/2))
```

Rubi [A] time = 1.43, antiderivative size = 1198, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2330, 2318, 2317, 2374, 6589, 2383}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^3/(d + e*x^3)^2,x]
```

```
[Out] (x*(a + b*Log[c*x^n])^3)/(9*d^(5/3)*(d^(1/3) + e^(1/3)*x)) - ((-1)^(1/3)*x*
(a + b*Log[c*x^n])^3)/((1 + (-1)^(1/3))^4*d^(5/3)*((-1)^(2/3)*d^(1/3) + e^(
1/3)*x)) + (x*(a + b*Log[c*x^n])^3)/(9*d^(5/3)*(d^(1/3) + (-1)^(2/3)*e^(1/3
)*x)) - (b*n*(a + b*Log[c*x^n])^2*Log[1 + (e^(1/3)*x)/d^(1/3)])/(3*d^(5/3)*
e^(1/3)) + (2*(a + b*Log[c*x^n])^3*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)
*e^(1/3)) + (3*(-1)^(1/3)*b*n*(a + b*Log[c*x^n])^2*Log[1 - ((-1)^(1/3)*e^(1
/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - ((2*I)*Sqrt[3]*(a +
 b*Log[c*x^n])^3*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))
^5*d^(5/3)*e^(1/3)) + ((-1)^(1/3)*b*n*(a + b*Log[c*x^n])^2*Log[1 + ((-1)^(2
/3)*e^(1/3)*x)/d^(1/3)])/(3*d^(5/3)*e^(1/3)) + (2*(a + b*Log[c*x^n])^3*Log[
1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) -
```

```
(2*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((e^(1/3)*x)/d^(1/3))])/(3*d^(5/
3)*e^(1/3)) + (2*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((e^(1/3)*x)/d^(1/3))
])/(3*d^(5/3)*e^(1/3)) + (6*(-1)^(1/3)*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2
, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - (
(6*I)*Sqrt[3]*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^
(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) + (2*(-1)^(1/3)*b^2*n^2*(a + b
*Log[c*x^n])*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1
/3)) + (6*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1
/3))])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) + (2*b^3*n^3*PolyLog[3, -((e^(1
/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) - (4*b^2*n^2*(a + b*Log[c*x^n])*PolyL
og[3, -((e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) - (6*(-1)^(1/3)*b^3*n^3*
PolyLog[3, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(
1/3)) + ((12*I)*Sqrt[3]*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3, ((-1)^(1/3)*e
^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) - (2*(-1)^(1/3)*b^
3*n^3*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) -
(12*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))
])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) + (4*b^3*n^3*PolyLog[4, -((e^(1/3)*
x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) - ((12*I)*Sqrt[3]*b^3*n^3*PolyLog[4, ((-1
)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) + (12*b^3
*n^3*PolyLog[4, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/((1 + (-1)^(1/3))^4*d^(
5/3)*e^(1/3))
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2383

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^p)/q
, x] - Dist[(b*n*p)/q, Int[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^(p - 1
))/x, x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^3}{\left(d+ex^3\right)^2}dx = \int \left(\frac{\left(a+b\log\left(cx^n\right)\right)^3}{9d^{4/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)^2} + \frac{2\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}\left(a+b\log\left(cx^n\right)\right)^3}{\left(1+\sqrt[3]{-1}\right)^4 d^{4/3}\left(-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}x\right)^2}\right.$$

$$= \frac{2\int \frac{\left(a+b\log\left(cx^n\right)\right)^3}{\sqrt[3]{d}+\sqrt[3]{e}x}dx}{9d^{5/3}} + \frac{2\int \frac{\left(a+b\log\left(cx^n\right)\right)^3}{\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x}dx}{9d^{5/3}} - \frac{\left(2(-1)^{5/6}\sqrt{3}\right)\int \frac{\left(a+b\log\left(cx^n\right)\right)^3}{-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}x}dx}{\left(1+\sqrt[3]{-1}\right)^5 d^{5/3}} + \frac{\int \frac{(a+}{(}}{}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} + \frac{2(a+}{}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} - \frac{bn(a}{}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} - \frac{bn(a}{}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x\left(a+b\log\left(cx^n\right)\right)^3}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} - \frac{bn(a}{}$$

Mathematica [A] time = 7.80, size = 2215, normalized size = 1.85

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])^3/(d + e*x^3)^2,x]
```

```
[Out] (x*(a + b*(-(n*Log[x]) + Log[c*x^n]))^3)/(3*d*(d + e*x^3)) + (2*ArcTan[(-d^
(1/3) + 2*e^(1/3)*x)/(Sqrt[3]*d^(1/3))]*(a + b*(-(n*Log[x]) + Log[c*x^n]))^
3)/(3*Sqrt[3]*d^(5/3)*e^(1/3)) + (2*(a + b*(-(n*Log[x]) + Log[c*x^n]))^3*Lo
g[d^(1/3) + e^(1/3)*x])/(9*d^(5/3)*e^(1/3)) - ((a + b*(-(n*Log[x]) + Log[c*
x^n]))^3*Log[d^(2/3) - d^(1/3)*e^(1/3)*x + e^(2/3)*x^2])/(9*d^(5/3)*e^(1/3)
) + 3*b*n*(a + b*(-(n*Log[x]) + Log[c*x^n]))^2*(-1/3*((-1 + (-1)^(1/3))*((-
((-1)^(1/3)/d^(1/3)) - ((-1)^(2/3)*d^(1/3) + e^(1/3)*x)^(-1))*Log[x] + ((-1
)^(1/3)*Log[-((-1)^(2/3)*d^(1/3)) - e^(1/3)*x])/d^(1/3)))/((1 + (-1)^(1/3))
^2*d^(4/3)*e^(1/3)) + ((-1)^(1/3)*((d^(-1/3) - (d^(1/3) + e^(1/3)*x)^(-1))*
Log[x] - Log[d^(1/3) + e^(1/3)*x]/d^(1/3)))/(3*(1 + (-1)^(1/3))^2*d^(4/3)*e
^(1/3)) - (Log[x]/(e^(1/3)*((-1)^(1/3)*d^(1/3) - e^(1/3)*x)) - (-(((-1)^(2/
3)*Log[x])/d^(1/3)) + ((-1)^(2/3)*Log[d^(1/3) + (-1)^(2/3)*e^(1/3)*x])/d^(1
/3))/e^(1/3))/(3*(1 + (-1)^(1/3))^2*d^(4/3)) + (2*(-1)^(1/3)*(Log[x]*Log[1
+ (e^(1/3)*x)/d^(1/3)] + PolyLog[2, -((e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^
(1/3))^2*d^(5/3)*e^(1/3)) - (2*(Log[x]*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/
3)] + PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)]))/(3*(1 + (-1)^(1/3))^2*d^
(5/3)*e^(1/3)) - (2*(-1 + (-1)^(1/3))*(Log[x]*Log[1 + ((-1)^(2/3)*e^(1/3)*x
```

```
)/d^(1/3)] + PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(
1/3))^2*d^(5/3)*e^(1/3))) + 3*b^2*n^2*(a + b*(-(n*Log[x]) + Log[c*x^n]))*((
(-1)^(1/3)*(Log[x]*((e^(1/3)*x*Log[x])/(d^(1/3) + e^(1/3)*x) - 2*Log[1 + (e
^(1/3)*x)/d^(1/3)]) - 2*PolyLog[2, -((e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(
1/3))^2*d^(5/3)*e^(1/3)) - ((-1 + (-1)^(1/3))*(Log[x]*((-((-1)^(1/3)/d^(1/3
)) - ((-1)^(2/3)*d^(1/3) + e^(1/3)*x)^(-1))*Log[x] + (2*(-1)^(1/3)*Log[1 -
((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3)) + (2*(-1)^(1/3)*PolyLog[2, ((-1)^
(1/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3)))/(3*(1 + (-1)^(1/3))^2*d^(4/3)*e^(1/3))
 - (Log[x]*((-1)^(2/3)*e^(1/3)*x*Log[x] - 2*(d^(1/3) + (-1)^(2/3)*e^(1/3)*x
)*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)]) - 2*(d^(1/3) + (-1)^(2/3)*e^(1/3
)*x)*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/(3*(1 + (-1)^(1/3))^2*d
^(4/3)*(-((-1)^(1/3)*d^(2/3)*e^(1/3)) + d^(1/3)*e^(2/3)*x)) + (2*(-1)^(1/3)
*(Log[x]^2*Log[1 + (e^(1/3)*x)/d^(1/3)] + 2*Log[x]*PolyLog[2, -((e^(1/3)*x)
/d^(1/3))] - 2*PolyLog[3, -((e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3))^2*d
^(5/3)*e^(1/3)) - (2*(Log[x]^2*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] + 2*
Log[x]*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] - 2*PolyLog[3, ((-1)^(1/3
)*e^(1/3)*x)/d^(1/3)]))/(3*(1 + (-1)^(1/3))^2*d^(5/3)*e^(1/3)) - (2*(-1 + (
-1)^(1/3))*(Log[x]^2*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)] + 2*Log[x]*Pol
yLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))] - 2*PolyLog[3, -(((-1)^(2/3)*e^(
1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3))^2*d^(5/3)*e^(1/3))) + b^3*n^3*(((-1
)^(1/3)*(Log[x]^2*((d^(-1/3) - (d^(1/3) + e^(1/3)*x)^(-1))*Log[x] - (3*Log[
1 + (e^(1/3)*x)/d^(1/3)])/d^(1/3)) - (6*Log[x]*PolyLog[2, -((e^(1/3)*x)/d^(
1/3))])/d^(1/3) + (6*PolyLog[3, -((e^(1/3)*x)/d^(1/3))])/d^(1/3)))/(3*(1 +
(-1)^(1/3))^2*d^(4/3)*e^(1/3)) - ((-1 + (-1)^(1/3))*(-(((-1)^(1/3)*Log[x]^3
)/d^(1/3)) - Log[x]^3/((-1)^(2/3)*d^(1/3) + e^(1/3)*x) + (3*(-1)^(1/3)*Log[
x]^2*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3) + (6*(-1)^(1/3)*(Log[
x]*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] - PolyLog[3, ((-1)^(1/3)*e^(1
/3)*x)/d^(1/3)]))/d^(1/3)))/(3*(1 + (-1)^(1/3))^2*d^(4/3)*e^(1/3)) - (((-1)
^(2/3)*Log[x]^3)/d^(1/3) + Log[x]^3/((-1)^(1/3)*d^(1/3) - e^(1/3)*x) - (3*(
-1)^(2/3)*Log[x]^2*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3) - (6*(-
1)^(2/3)*(Log[x]*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))] - PolyLog[3,
 -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))]))/d^(1/3))/(3*(1 + (-1)^(1/3))^2*d^(4/3
)*e^(1/3)) + (2*(-1)^(1/3)*(Log[x]^3*Log[1 + (e^(1/3)*x)/d^(1/3)] + 3*Log[x
]^2*PolyLog[2, -((e^(1/3)*x)/d^(1/3))] - 6*Log[x]*PolyLog[3, -((e^(1/3)*x)/
d^(1/3))] + 6*PolyLog[4, -((e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3))^2*d^
(5/3)*e^(1/3)) - (2*(Log[x]^3*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] + 3*L
og[x]^2*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] - 6*Log[x]*PolyLog[3, ((
-1)^(1/3)*e^(1/3)*x)/d^(1/3)] + 6*PolyLog[4, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)
]))/(3*(1 + (-1)^(1/3))^2*d^(5/3)*e^(1/3)) - (2*(-1 + (-1)^(1/3))*(Log[x]^3
*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)] + 3*Log[x]^2*PolyLog[2, -(((-1)^(2
/3)*e^(1/3)*x)/d^(1/3))] - 6*Log[x]*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(
1/3))] + 6*PolyLog[4, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/
3))^2*d^(5/3)*e^(1/3)))
```

fricas [F] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^3\log\left(cx^n\right)^3+3\,ab^2\log\left(cx^n\right)^2+3\,a^2b\log\left(cx^n\right)+a^3}{e^2x^6+2\,dex^3+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/(e*x^3+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^3*log(c*x^n)^3 + 3*a*b^2*log(c*x^n)^2 + 3*a^2*b*log(c*x^n) + a^
3)/(e^2*x^6 + 2*d*e*x^3 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^3}{\left(ex^3+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*log(c*x^n))^3/(e*x^3+d)^2,x, algorithm="giac")

[Out] integrate((b*log(c*x^n) + a)^3/(e*x^3 + d)^2, x)

maple [F] time = 31.12, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(cx^n)+a)^3}{(ex^3+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*ln(c*x^n)+a)^3/(e*x^3+d)^2,x)

[Out] int((b*ln(c*x^n)+a)^3/(e*x^3+d)^2,x)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{9}a^3\left(\frac{3x}{dex^3+d^2}+\frac{2\sqrt{3}\arctan\left(\frac{\sqrt{3}\left(2x-\left(\frac{d}{e}\right)^{\frac{1}{3}}\right)}{3\left(\frac{d}{e}\right)^{\frac{1}{3}}}\right)}{de\left(\frac{d}{e}\right)^{\frac{2}{3}}}-\frac{\log\left(x^2-x\left(\frac{d}{e}\right)^{\frac{1}{3}}+\left(\frac{d}{e}\right)^{\frac{2}{3}}\right)}{de\left(\frac{d}{e}\right)^{\frac{2}{3}}}+\frac{2\log\left(x+\left(\frac{d}{e}\right)^{\frac{1}{3}}\right)}{de\left(\frac{d}{e}\right)^{\frac{2}{3}}}\right)+\int \frac{b^3\log(c)^3+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*log(c*x^n))^3/(e*x^3+d)^2,x, algorithm="maxima")

[Out] 1/9*a^3*(3*x/(d*e*x^3 + d^2) + 2*sqrt(3)*arctan(1/3*sqrt(3)*(2*x - (d/e)^(1/3))/(d/e)^(1/3))/(d*e*(d/e)^(2/3)) - log(x^2 - x*(d/e)^(1/3) + (d/e)^(2/3))/(d*e*(d/e)^(2/3)) + 2*log(x + (d/e)^(1/3))/(d*e*(d/e)^(2/3))) + integrate((b^3*log(c)^3 + b^3*log(x^n)^3 + 3*a*b^2*log(c)^2 + 3*a^2*b*log(c) + 3*(b^3*log(c) + a*b^2)*log(x^n)^2 + 3*(b^3*log(c)^2 + 2*a*b^2*log(c) + a^2*b)*log(x^n))/(e^2*x^6 + 2*d*e*x^3 + d^2), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\ln(cx^n))^3}{(ex^3+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a + b*log(c*x^n))^3/(d + e*x^3)^2,x)

[Out] int((a + b*log(c*x^n))^3/(d + e*x^3)^2, x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*ln(c*x**n))**3/(e*x**3+d)**2,x)

[Out] Timed out

3.325 $\int \frac{\left(a+b\log(cx^n)\right)^2}{\left(d+ex^3\right)^2}\,dx$

Optimal. Leaf size=860

$$-\frac{2b^2\text{Li}_2\left(-\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^2}{9d^{5/3}\sqrt[3]{e}}+\frac{2\sqrt[3]{-1}\,b^2\text{Li}_2\left(\frac{\sqrt[3]{-1}\,\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^2}{\left(1+\sqrt[3]{-1}\right)^4d^{5/3}\sqrt[3]{e}}+\frac{2\sqrt[3]{-1}\,b^2\text{Li}_2\left(-\frac{(-1)^{2/3}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^2}{9d^{5/3}\sqrt[3]{e}}-\frac{4b^2\text{Li}_3\left(-\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^2}{9d^{5/3}\sqrt[3]{e}}+\frac{4i\sqrt{3}\,b^2\text{Li}_3}{\left(1+\sqrt[3]{-1}\right.}$$

```
[Out] 1/9*x*(a+b*ln(c*x^n))^2/d^(5/3)/(d^(1/3)+e^(1/3)*x)-(-1)^(1/3)*x*(a+b*ln(c*
x^n))^2/(1+(-1)^(1/3))^4/d^(5/3)/((-1)^(2/3)*d^(1/3)+e^(1/3)*x)+1/9*x*(a+b*
ln(c*x^n))^2/d^(5/3)/(d^(1/3)+(-1)^(2/3)*e^(1/3)*x)-2/9*b*n*(a+b*ln(c*x^n))
*ln(1+e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)+2/9*(a+b*ln(c*x^n))^2*ln(1+e^(1/3)
*x/d^(1/3))/d^(5/3)/e^(1/3)+2*(-1)^(1/3)*b*n*(a+b*ln(c*x^n))*ln(1-(-1)^(1/3
)*e^(1/3)*x/d^(1/3))/(1+(-1)^(1/3))^4/d^(5/3)/e^(1/3)+2/9*(-1)^(1/3)*b*n*(a
+b*ln(c*x^n))*ln(1+(-1)^(2/3)*e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)-2/9*b^2*n^
2*polylog(2,-e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)+4/9*b*n*(a+b*ln(c*x^n))*pol
ylog(2,-e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)+2*(-1)^(1/3)*b^2*n^2*polylog(2,(
-1)^(1/3)*e^(1/3)*x/d^(1/3))/(1+(-1)^(1/3))^4/d^(5/3)/e^(1/3)+2/9*(-1)^(1/3
)*b^2*n^2*polylog(2,-(-1)^(2/3)*e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)-4/9*b^2*
n^2*polylog(3,-e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)-4/9*(a+b*ln(c*x^n))^2*ln(
1-1/2*e^(1/3)*x*(1-I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1/3)/(1-I*3^(1/2))-8/9*b*
n*(a+b*ln(c*x^n))*polylog(2,1/2*e^(1/3)*x*(1-I*3^(1/2))/d^(1/3))/d^(5/3)/e^
(1/3)/(1-I*3^(1/2))+8/9*b^2*n^2*polylog(3,1/2*e^(1/3)*x*(1-I*3^(1/2))/d^(1/
3))/d^(5/3)/e^(1/3)/(1-I*3^(1/2))-4/9*(a+b*ln(c*x^n))^2*ln(1-1/2*e^(1/3)*x*
(1+I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1/3)/(1+I*3^(1/2))-8/9*b*n*(a+b*ln(c*x^n)
)*polylog(2,1/2*e^(1/3)*x*(1+I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1/3)/(1+I*3^(1/
2))+8/9*b^2*n^2*polylog(3,1/2*e^(1/3)*x*(1+I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1
/3)/(1+I*3^(1/2))
```

Rubi [A] time = 0.77, antiderivative size = 860, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2330, 2318, 2317, 2391, 2374, 6589}

$$-\frac{2b^2\text{PolyLog}\left(2,-\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^2}{9d^{5/3}\sqrt[3]{e}}+\frac{2\sqrt[3]{-1}\,b^2\text{PolyLog}\left(2,\frac{\sqrt[3]{-1}\,\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^2}{\left(1+\sqrt[3]{-1}\right)^4d^{5/3}\sqrt[3]{e}}+\frac{2\sqrt[3]{-1}\,b^2\text{PolyLog}\left(2,-\frac{(-1)^{2/3}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^2}{9d^{5/3}\sqrt[3]{e}}-\frac{4b^2\text{Pol}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(d + e*x^3)^2,x]
```

```
[Out] (x*(a + b*Log[c*x^n])^2)/(9*d^(5/3)*(d^(1/3) + e^(1/3)*x)) - ((-1)^(1/3)*x*
(a + b*Log[c*x^n])^2)/((1 + (-1)^(1/3))^4*d^(5/3)*((-1)^(2/3)*d^(1/3) + e^(
1/3)*x)) + (x*(a + b*Log[c*x^n])^2)/(9*d^(5/3)*(d^(1/3) + (-1)^(2/3)*e^(1/3
)*x)) - (2*b*n*(a + b*Log[c*x^n])*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)*
e^(1/3)) + (2*(a + b*Log[c*x^n])^2*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)
*e^(1/3)) + (2*(-1)^(1/3)*b*n*(a + b*Log[c*x^n])*Log[1 - ((-1)^(1/3)*e^(1/3
)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - ((2*I)*Sqrt[3]*(a + b
*Log[c*x^n])^2*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5
*d^(5/3)*e^(1/3)) + (2*(-1)^(1/3)*b*n*(a + b*Log[c*x^n])*Log[1 + ((-1)^(2/3
)*e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)*e^(1/3)) + (2*(a + b*Log[c*x^n])^2*Log[1
+ ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - (
2*b^2*n^2*PolyLog[2, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3)) + (4*b*n*
(a + b*Log[c*x^n])*PolyLog[2, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3))
+ (2*(-1)^(1/3)*b^2*n^2*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (
-1)^(1/3))^4*d^(5/3)*e^(1/3)) - ((4*I)*Sqrt[3]*b*n*(a + b*Log[c*x^n])*PolyL
```

```
og[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3))
 + (2*(-1)^(1/3)*b^2*n^2*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/(9*
d^(5/3)*e^(1/3)) + (4*b*n*(a + b*Log[c*x^n])*PolyLog[2, -(((-1)^(2/3)*e^(1/
3)*x)/d^(1/3))])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - (4*b^2*n^2*PolyLog[
3, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3)) + ((4*I)*Sqrt[3]*b^2*n^2*Po
lyLog[3, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/
3)) - (4*b^2*n^2*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/((1 + (-1)^
(1/3))^4*d^(5/3)*e^(1/3))
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex^3\right)^2}\,dx = \int\left(\frac{\left(a+b\log\left(cx^n\right)\right)^2}{9d^{4/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)^2} + \frac{2\left(a+b\log\left(cx^n\right)\right)^2}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}\left(a+b\log\left(cx^n\right)\right)^2}{\left(1+\sqrt[3]{-1}\right)^4 d^{4/3}\left(-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}\right.}\right.$$

$$= \frac{2\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{\sqrt[3]{d}+\sqrt[3]{e}x}dx}{9d^{5/3}} + \frac{2\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x}dx}{9d^{5/3}} - \frac{\left(2(-1)^{5/6}\sqrt{3}\right)\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}x}dx}{\left(1+\sqrt[3]{-1}\right)^5 d^{5/3}} + \ldots$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x\left(a+b\log\left(cx^n\right)\right)^2}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} + \frac{2(\ldots}{\ldots}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x\left(a+b\log\left(cx^n\right)\right)^2}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} - \frac{2bn\ldots}{\ldots}$$

$$= \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x\left(a+b\log\left(cx^n\right)\right)^2}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} - \frac{2bn\ldots}{\ldots}$$

Mathematica [A] time = 6.16, size = 1379, normalized size = 1.60

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(d + e*x^3)^2,x]
```

```
[Out] (x*(a + b*(-(n*Log[x]) + Log[c*x^n]))^2)/(3*d*(d + e*x^3)) + (2*ArcTan[(-d^
(1/3) + 2*e^(1/3)*x)/(Sqrt[3]*d^(1/3))]*(a + b*(-(n*Log[x]) + Log[c*x^n]))^
2)/(3*Sqrt[3]*d^(5/3)*e^(1/3)) + (2*(a + b*(-(n*Log[x]) + Log[c*x^n]))^2*Lo
g[d^(1/3) + e^(1/3)*x])/(9*d^(5/3)*e^(1/3)) - ((a + b*(-(n*Log[x]) + Log[c*
x^n]))^2*Log[d^(2/3) - d^(1/3)*e^(1/3)*x + e^(2/3)*x^2])/(9*d^(5/3)*e^(1/3)
) + 2*b*n*(a + b*(-(n*Log[x]) + Log[c*x^n]))*(-1/3*((-1 + (-1)^(1/3))*((-((
-1)^(1/3)/d^(1/3)) - ((-1)^(2/3)*d^(1/3) + e^(1/3)*x)^(-1))*Log[x] + ((-1)^
(1/3)*Log[-((-1)^(2/3)*d^(1/3)) - e^(1/3)*x])/d^(1/3)))/((1 + (-1)^(1/3))^2
*d^(4/3)*e^(1/3)) + ((-1)^(1/3)*((d^(-1/3) - (d^(1/3) + e^(1/3)*x)^(-1))*Lo
g[x] - Log[d^(1/3) + e^(1/3)*x]/d^(1/3)))/(3*(1 + (-1)^(1/3))^2*d^(4/3)*e^(
1/3)) - (Log[x]/(e^(1/3)*((-1)^(1/3)*d^(1/3) - e^(1/3)*x)) - (-(((-1)^(2/3)
*Log[x])/d^(1/3)) + ((-1)^(2/3)*Log[d^(1/3) + (-1)^(2/3)*e^(1/3)*x])/d^(1/3
))/e^(1/3))/(3*(1 + (-1)^(1/3))^2*d^(4/3)) + (2*(-1)^(1/3)*(Log[x]*Log[1 +
(e^(1/3)*x)/d^(1/3)] + PolyLog[2, -((e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1
/3))^2*d^(5/3)*e^(1/3)) - (2*(Log[x]*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)
] + PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)]))/(3*(1 + (-1)^(1/3))^2*d^(5
/3)*e^(1/3)) - (2*(-1 + (-1)^(1/3))*(Log[x]*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/
d^(1/3)] + PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/
3))^2*d^(5/3)*e^(1/3))) + b^2*n^2*(((-1)^(1/3)*(Log[x]*((e^(1/3)*x*Log[x])/
(d^(1/3) + e^(1/3)*x) - 2*Log[1 + (e^(1/3)*x)/d^(1/3)]) - 2*PolyLog[2, -((e
^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3))^2*d^(5/3)*e^(1/3)) - ((-1 + (-1)^
(1/3))*(Log[x]*((-((-1)^(1/3)/d^(1/3)) - ((-1)^(2/3)*d^(1/3) + e^(1/3)*x)^(
-1))*Log[x] + (2*(-1)^(1/3)*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3
)) + (2*(-1)^(1/3)*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3)))/(3
*(1 + (-1)^(1/3))^2*d^(4/3)*e^(1/3)) - (Log[x]*((-1)^(2/3)*e^(1/3)*x*Log[x]
 - 2*(d^(1/3) + (-1)^(2/3)*e^(1/3)*x)*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3
)]) - 2*(d^(1/3) + (-1)^(2/3)*e^(1/3)*x)*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x
```

```
)/d^(1/3))])/(3*(1 + (-1)^(1/3))^2*d^(4/3)*(-((-1)^(1/3)*d^(2/3)*e^(1/3)) +
 d^(1/3)*e^(2/3)*x)) + (2*(-1)^(1/3)*(Log[x]^2*Log[1 + (e^(1/3)*x)/d^(1/3)]
 + 2*Log[x]*PolyLog[2, -((e^(1/3)*x)/d^(1/3))] - 2*PolyLog[3, -((e^(1/3)*x)
/d^(1/3))]))/(3*(1 + (-1)^(1/3))^2*d^(5/3)*e^(1/3)) - (2*(Log[x]^2*Log[1 -
((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] + 2*Log[x]*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x
)/d^(1/3)] - 2*PolyLog[3, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)]))/(3*(1 + (-1)^(1
/3))^2*d^(5/3)*e^(1/3)) - (2*(-1 + (-1)^(1/3))*(Log[x]^2*Log[1 + ((-1)^(2/3
)*e^(1/3)*x)/d^(1/3)] + 2*Log[x]*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3
))] - 2*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3))
^2*d^(5/3)*e^(1/3)))
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2\log\left(cx^n\right)^2+2\,ab\log\left(cx^n\right)+a^2}{e^2x^6+2\,dex^3+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x^3+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^6 + 2*d*e*x^3 +
 d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^2}{\left(ex^3+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x^3+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/(e*x^3 + d)^2, x)
```

maple [F] time = 41.44, size = 0, normalized size = 0.00

$$\int\frac{\left(b\ln\left(c\,x^n\right)+a\right)^2}{\left(e\,x^3+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/(e*x^3+d)^2,x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/(e*x^3+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{9}a^2\left(\frac{3\,x}{dex^3+d^2}+\frac{2\,\sqrt{3}\,\arctan\left(\frac{\sqrt{3}\left(2\,x-\left(\frac{d}{e}\right)^{\frac{1}{3}}\right)}{3\left(\frac{d}{e}\right)^{\frac{1}{3}}}\right)}{de\left(\frac{d}{e}\right)^{\frac{2}{3}}}-\frac{\log\left(x^2-x\left(\frac{d}{e}\right)^{\frac{1}{3}}+\left(\frac{d}{e}\right)^{\frac{2}{3}}\right)}{de\left(\frac{d}{e}\right)^{\frac{2}{3}}}+\frac{2\,\log\left(x+\left(\frac{d}{e}\right)^{\frac{1}{3}}\right)}{de\left(\frac{d}{e}\right)^{\frac{2}{3}}}\right)+\int\frac{b^2\log(c)^2+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x^3+d)^2,x, algorithm="maxima")
```

```
[Out] 1/9*a^2*(3*x/(d*e*x^3 + d^2) + 2*sqrt(3)*arctan(1/3*sqrt(3)*(2*x - (d/e)^(1
/3))/(d/e)^(1/3))/(d*e*(d/e)^(2/3)) - log(x^2 - x*(d/e)^(1/3) + (d/e)^(2/3)
)/(d*e*(d/e)^(2/3)) + 2*log(x + (d/e)^(1/3))/(d*e*(d/e)^(2/3))) + integrate
((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x
^n))/(e^2*x^6 + 2*d*e*x^3 + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b \ln(c x^n))^2}{\left(e x^3 + d\right)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(d + e*x^3)^2,x)
```

```
[Out] int((a + b*log(c*x^n))^2/(d + e*x^3)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/(e*x**3+d)**2,x)
```

```
[Out] Timed out
```

3.326 $\int \frac{a+b\log(cx^n)}{\left(d+ex^3\right)^2}\,dx$

Optimal. Leaf size=520

$$\frac{2\log\left(\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}+1\right)\left(a+b\log\left(cx^n\right)\right)}{9d^{5/3}\sqrt[3]{e}}-\frac{2i\sqrt{3}\log\left(1-\frac{\sqrt[3]{-1}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\left(1+\sqrt[3]{-1}\right)^5d^{5/3}\sqrt[3]{e}}+\frac{2\log\left(\frac{(-1)^{2/3}\sqrt[3]{e}x}{\sqrt[3]{d}}+1\right)\left(a+b\log\left(cx^n\right)\right)}{\left(1+\sqrt[3]{-1}\right)^4d^{5/3}\sqrt[3]{e}}$$

```
[Out] 1/9*x*(a+b*ln(c*x^n))/d^(5/3)/(d^(1/3)+e^(1/3)*x)-(-1)^(1/3)*x*(a+b*ln(c*x^
n))/(1+(-1)^(1/3))^4/d^(5/3)/((-1)^(2/3)*d^(1/3)+e^(1/3)*x)+1/9*x*(a+b*ln(c
*x^n))/d^(5/3)/(d^(1/3)+(-1)^(2/3)*e^(1/3)*x)+(-1)^(1/3)*b*n*ln(-(-1)^(2/3)
*d^(1/3)-e^(1/3)*x)/(1+(-1)^(1/3))^4/d^(5/3)/e^(1/3)-1/9*b*n*ln(d^(1/3)+e^(
1/3)*x)/d^(5/3)/e^(1/3)+1/9*(-1)^(1/3)*b*n*ln(d^(1/3)+(-1)^(2/3)*e^(1/3)*x)
/d^(5/3)/e^(1/3)+2/9*(a+b*ln(c*x^n))*ln(1+e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3
)+2/9*b*n*polylog(2,-e^(1/3)*x/d^(1/3))/d^(5/3)/e^(1/3)-4/9*(a+b*ln(c*x^n))
*ln(1-1/2*e^(1/3)*x*(1-I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1/3)/(1-I*3^(1/2))-4/
9*b*n*polylog(2,1/2*e^(1/3)*x*(1-I*3^(1/2))/d^(1/3))/d^(5/3)/e^(1/3)/(1-I*3
^(1/2))-4/9*(a+b*ln(c*x^n))*ln(1-1/2*e^(1/3)*x*(1+I*3^(1/2))/d^(1/3))/d^(5/
3)/e^(1/3)/(1+I*3^(1/2))-4/9*b*n*polylog(2,1/2*e^(1/3)*x*(1+I*3^(1/2))/d^(1
/3))/d^(5/3)/e^(1/3)/(1+I*3^(1/2))
```

Rubi [A] time = 0.46, antiderivative size = 520, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.550, Rules used = {199, 200, 31, 634, 617, 204, 628, 2330, 2314, 2317, 2391}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}\right)}{9d^{5/3}\sqrt[3]{e}}-\frac{2i\sqrt{3}bn\text{PolyLog}\left(2,\frac{\sqrt[3]{-1}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)}{\left(1+\sqrt[3]{-1}\right)^5d^{5/3}\sqrt[3]{e}}+\frac{2bn\text{PolyLog}\left(2,-\frac{(-1)^{2/3}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)}{\left(1+\sqrt[3]{-1}\right)^4d^{5/3}\sqrt[3]{e}}+\frac{2\log\left(\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}+1\right)\left(a+b\log\right.}{9d^{5/3}\sqrt[3]{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^3)^2,x]
```

```
[Out] (x*(a + b*Log[c*x^n]))/(9*d^(5/3)*(d^(1/3) + e^(1/3)*x)) - ((-1)^(1/3)*x*(a
 + b*Log[c*x^n]))/((1 + (-1)^(1/3))^4*d^(5/3)*((-1)^(2/3)*d^(1/3) + e^(1/3)
*x)) + (x*(a + b*Log[c*x^n]))/(9*d^(5/3)*(d^(1/3) + (-1)^(2/3)*e^(1/3)*x))
+ ((-1)^(1/3)*b*n*Log[-((-1)^(2/3)*d^(1/3)) - e^(1/3)*x])/((1 + (-1)^(1/3))
^4*d^(5/3)*e^(1/3)) - (b*n*Log[d^(1/3) + e^(1/3)*x])/(9*d^(5/3)*e^(1/3)) +
((-1)^(1/3)*b*n*Log[d^(1/3) + (-1)^(2/3)*e^(1/3)*x])/(9*d^(5/3)*e^(1/3)) +
(2*(a + b*Log[c*x^n])*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)*e^(1/3)) - (
(2*I)*Sqrt[3]*(a + b*Log[c*x^n])*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/(
(1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) + (2*(a + b*Log[c*x^n])*Log[1 + ((-1)^(
2/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) + (2*b*n*Pol
yLog[2, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3)) - ((2*I)*Sqrt[3]*b*n*P
olyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1
/3)) + (2*b*n*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/((1 + (-1)^(1/
3))^4*d^(5/3)*e^(1/3))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
```

```
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^3)^(-1), x_Symbol] :> Dist[1/(3*Rt[a, 3]^2), Int[1/(
Rt[a, 3] + Rt[b, 3]*x), x], x] + Dist[1/(3*Rt[a, 3]^2), Int[(2*Rt[a, 3] - R
t[b, 3]*x)/(Rt[a, 3]^2 - Rt[a, 3]*Rt[b, 3]*x + Rt[b, 3]^2*x^2), x], x] /; F
reeQ[{a, b}, x]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex^3)^2}\,dx = \int\left(\frac{a+b\log(cx^n)}{9d^{4/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)^2}+\frac{2\left(a+b\log(cx^n)\right)}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)}+\frac{(-1)^{2/3}\left(a+b\log(cx^n)\right)}{\left(1+\sqrt[3]{-1}\right)^4 d^{4/3}\left(-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}x\right)^2}- \cdots\right.$$

$$= \frac{2\int \frac{a+b\log(cx^n)}{\sqrt[3]{d}+\sqrt[3]{e}x}\,dx}{9d^{5/3}}+\frac{2\int \frac{a+b\log(cx^n)}{\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x}\,dx}{9d^{5/3}}-\frac{\left(2(-1)^{5/6}\sqrt{3}\right)\int \frac{a+b\log(cx^n)}{-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}x}\,dx}{\left(1+\sqrt[3]{-1}\right)^5 d^{5/3}}+\frac{\int \frac{a+b\log(c\cdots}{\left(\sqrt[3]{d}+\sqrt[3]{e}\cdots\right.}}{9d^{4/3}\cdots}$$

$$= \frac{x\left(a+b\log(cx^n)\right)}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)}+\frac{(-1)^{2/3}x\left(a+b\log(cx^n)\right)}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)}+\frac{x\left(a+b\log(cx^n)\right)}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)}+\frac{2\left(a+b\log\cdots\right.}{\cdots}$$

$$= \frac{x\left(a+b\log(cx^n)\right)}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)}+\frac{(-1)^{2/3}x\left(a+b\log(cx^n)\right)}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)}+\frac{x\left(a+b\log(cx^n)\right)}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)}-\frac{(-1)^{2/3}bn\,\log\cdots}{\cdots}$$

Mathematica [A] time = 1.87, size = 571, normalized size = 1.10

$$\frac{-\frac{\log\left(d^{2/3}-\sqrt[3]{d}\sqrt[3]{e}x+e^{2/3}x^2\right)\left(a+b\log(cx^n)-bn\log(x)\right)}{\sqrt[3]{e}}+\frac{3d^{2/3}x\left(a+b\log(cx^n)-bn\log(x)\right)}{d+ex^3}+\frac{2\log\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)\left(a+b\log(cx^n)-bn\log(x)\right)}{\sqrt[3]{e}}-\frac{2\sqrt{3}\tan\cdots}{\cdots}}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^3)^2,x]
```

```
[Out] ((3*d^(2/3)*x*(a - b*n*Log[x] + b*Log[c*x^n]))/(d + e*x^3) - (2*Sqrt[3]*Arc
Tan[(1 - (2*e^(1/3)*x)/d^(1/3))/Sqrt[3]]*(a - b*n*Log[x] + b*Log[c*x^n]))/e
^(1/3) + (2*(a - b*n*Log[x] + b*Log[c*x^n])*Log[d^(1/3) + e^(1/3)*x])/e^(1/
3) - ((a - b*n*Log[x] + b*Log[c*x^n])*Log[d^(2/3) - d^(1/3)*e^(1/3)*x + e^(
2/3)*x^2])/e^(1/3) + (3*b*n*(((-1 + (-1)^(1/3))*((-1)^(1/3)*e^(1/3)*x*Log[x
] + (d^(1/3) - (-1)^(1/3)*e^(1/3)*x)*Log[-((-1)^(2/3)*d^(1/3)) - e^(1/3)*x]
))/((-1)^(2/3)*d^(1/3)*e^(1/3) + e^(2/3)*x) + (-1)^(1/3)*((x*Log[x])/(d^(1/
3) + e^(1/3)*x) - Log[d^(1/3) + e^(1/3)*x]/e^(1/3)) + (-((-1)^(2/3)*e^(1/3)
*x*Log[x]) + (d^(1/3) + (-1)^(2/3)*e^(1/3)*x)*Log[d^(1/3) + (-1)^(2/3)*e^(1
/3)*x])/(-((-1)^(1/3)*d^(1/3)*e^(1/3)) + e^(2/3)*x) + (2*(-1)^(1/3)*(Log[x]
*Log[1 + (e^(1/3)*x)/d^(1/3)] + PolyLog[2, -((e^(1/3)*x)/d^(1/3))]))/e^(1/3
) - (2*(Log[x]*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] + PolyLog[2, ((-1)^(
1/3)*e^(1/3)*x)/d^(1/3)]))/e^(1/3) - (2*(-1 + (-1)^(1/3))*(Log[x]*Log[1 + (
(-1)^(2/3)*e^(1/3)*x)/d^(1/3)] + PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3
))]))/e^(1/3)))/(1 + (-1)^(1/3))^2)/(9*d^(5/3))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{e^2x^6+2\,dex^3+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^3+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^6 + 2*d*e*x^3 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex^{3}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^3+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^3 + d)^2, x)
```

maple [C] time = 0.37, size = 1388, normalized size = 2.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x^3+d)^2,x)
```

```
[Out] -2/9*b/d/e/(d/e)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))*n*ln
(x)-1/9*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/e/(d/e)^(2/3)*3^(1/2)*
arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))+1/3*b*x/d/(e*x^3+d)*ln(x^n)-1/9*a/d
/e/(d/e)^(2/3)*ln(x^2-(d/e)^(1/3)*x+(d/e)^(2/3))+1/3*b*ln(c)*x/d/(e*x^3+d)+
2/9*b*ln(c)/d/e/(d/e)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))
+1/9*b/d/e/(d/e)^(2/3)*ln(x^2-(d/e)^(1/3)*x+(d/e)^(2/3))*n*ln(x)-1/9*b*n/d/
e/(d/e)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))-2/9*b/d/e/(d/
e)^(2/3)*ln(x+(d/e)^(1/3))*n*ln(x)+2/9*a/d/e/(d/e)^(2/3)*ln(x+(d/e)^(1/3))+
2/9*b*n/e/d*sum(1/_R1^2*(ln(x)*ln((_R1-x)/_R1)+dilog((_R1-x)/_R1)),_R1=Root
Of(_Z^3*e+d))-1/9*I*b*Pi*csgn(I*c*x^n)^3/d/e/(d/e)^(2/3)*3^(1/2)*arctan(1/3
*3^(1/2)*(2/(d/e)^(1/3)*x-1))+1/18*I*b*Pi*csgn(I*c*x^n)^3/d/e/(d/e)^(2/3)*l
n(x^2-(d/e)^(1/3)*x+(d/e)^(2/3))-1/9*I*b*Pi*csgn(I*c*x^n)^3/d/e/(d/e)^(2/3)
*ln(x+(d/e)^(1/3))+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*x/d/(e*x^3+d)+1/6*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*x/d/(e*x^3+d)+2/9*a/d/e/(d/e)^(2/3)*3^(1/
2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))+2/9*b*ln(c)/d/e/(d/e)^(2/3)*ln(x
+(d/e)^(1/3))-1/9*b*ln(c)/d/e/(d/e)^(2/3)*ln(x^2-(d/e)^(1/3)*x+(d/e)^(2/3))
-1/18*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/e/(d/e)^(2/3)*ln(x^2-(d/e)^(1/3)
*x+(d/e)^(2/3))-1/18*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/e/(d/e)^(2/3)*ln(x^
2-(d/e)^(1/3)*x+(d/e)^(2/3))+1/3*a*x/d/(e*x^3+d)+1/9*I*b*Pi*csgn(I*x^n)*csg
n(I*c*x^n)^2/d/e/(d/e)^(2/3)*ln(x+(d/e)^(1/3))-1/6*I*b*Pi*csgn(I*c*x^n)^3*x
/d/(e*x^3+d)+2/9*b/d/e/(d/e)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3
)*x-1))*ln(x^n)-1/9*b*n/d/e/(d/e)^(2/3)*ln(x+(d/e)^(1/3))+1/18*b*n/d/e/(d/e
)^(2/3)*ln(x^2-(d/e)^(1/3)*x+(d/e)^(2/3))+2/9*b/d/e/(d/e)^(2/3)*ln(x+(d/e)^
(1/3))*ln(x^n)-1/9*b/d/e/(d/e)^(2/3)*ln(x^2-(d/e)^(1/3)*x+(d/e)^(2/3))*ln(x
^n)+1/18*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/e/(d/e)^(2/3)*ln(x^2-
(d/e)^(1/3)*x+(d/e)^(2/3))+1/9*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/e/(d/e)^(
2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))-1/6*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*x/d/(e*x^3+d)+1/9*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
/d/e/(d/e)^(2/3)*ln(x+(d/e)^(1/3))+1/9*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d
/e/(d/e)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))-1/9*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/e/(d/e)^(2/3)*ln(x+(d/e)^(1/3))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{9}a\left(\frac{3x}{dex^3+d^2}+\frac{2\sqrt{3}\arctan\left(\frac{\sqrt{3}\left(2x-\left(\frac{d}{e}\right)^{\frac{1}{3}}\right)}{3\left(\frac{d}{e}\right)^{\frac{1}{3}}}\right)}{de\left(\frac{d}{e}\right)^{\frac{2}{3}}}-\frac{\log\left(x^2-x\left(\frac{d}{e}\right)^{\frac{1}{3}}+\left(\frac{d}{e}\right)^{\frac{2}{3}}\right)}{de\left(\frac{d}{e}\right)^{\frac{2}{3}}}+\frac{2\log\left(x+\left(\frac{d}{e}\right)^{\frac{1}{3}}\right)}{de\left(\frac{d}{e}\right)^{\frac{2}{3}}}\right)+b\int\frac{\log(c)+\log}{e^2x^6+2\,dex}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^3+d)^2,x, algorithm="maxima")
```

```
[Out] 1/9*a*(3*x/(d*e*x^3 + d^2) + 2*sqrt(3)*arctan(1/3*sqrt(3)*(2*x - (d/e)^(1/3
))/(d/e)^(1/3))/(d*e*(d/e)^(2/3)) - log(x^2 - x*(d/e)^(1/3) + (d/e)^(2/3))/
(d*e*(d/e)^(2/3)) + 2*log(x + (d/e)^(1/3))/(d*e*(d/e)^(2/3))) + b*integrate
((log(c) + log(x^n))/(e^2*x^6 + 2*d*e*x^3 + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{\left(e\,x^3+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x^3)^2,x)
```

```
[Out] int((a + b*log(c*x^n))/(d + e*x^3)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x**3+d)**2,x)
```

```
[Out] Timed out
```

3.327 $\int \frac{1}{\left(d+ex^3\right)^2\left(a+b\log\left(cx^n\right)\right)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{\left(d+ex^3\right)^2\left(a+b\log\left(cx^n\right)\right)},x\right)$$

```
[Out] Unintegrable(1/(e*x^3+d)^2/(a+b*ln(c*x^n)),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(d+ex^3\right)^2\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^3)^2*(a + b*Log[c*x^n])),x]
[Out] Defer[Int][1/((d + e*x^3)^2*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{1}{\left(d+ex^3\right)^2\left(a+b\log\left(cx^n\right)\right)}\,dx = \int \frac{1}{\left(d+ex^3\right)^2\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Mathematica [A] time = 5.63, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d+ex^3\right)^2\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^3)^2*(a + b*Log[c*x^n])),x]
[Out] Integrate[1/((d + e*x^3)^2*(a + b*Log[c*x^n])), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{ae^2x^6+2\,adex^3+ad^2+\left(be^2x^6+2\,bdex^3+bd^2\right)\log\left(cx^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n)),x, algorithm="fricas")
[Out] integral(1/(a*e^2*x^6 + 2*a*d*e*x^3 + a*d^2 + (b*e^2*x^6 + 2*b*d*e*x^3 + b*
d^2)*log(c*x^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(ex^3+d\right)^2\left(b\log\left(cx^n\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n)),x, algorithm="giac")
[Out] integrate(1/((e*x^3 + d)^2*(b*log(c*x^n) + a)), x)
```

maple [A] time = 0.68, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\,x^{3}+d\right)^{2}\left(b\ln\left(c\,x^{n}\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^3+d)^2/(b*ln(c*x^n)+a),x)
[Out] int(1/(e*x^3+d)^2/(b*ln(c*x^n)+a),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(ex^{3}+d\right)^{2}\left(b\log\left(cx^{n}\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n)),x, algorithm="maxima")
[Out] integrate(1/((e*x^3 + d)^2*(b*log(c*x^n) + a)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\left(e\,x^{3}+d\right)^{2}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d + e*x^3)^2*(a + b*log(c*x^n))),x)
[Out] int(1/((d + e*x^3)^2*(a + b*log(c*x^n))), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**3+d)**2/(a+b*ln(c*x**n)),x)
[Out] Timed out
```

3.328 $\int \frac{1}{(d+ex^3)^2(a+b\log(cx^n))^2}\,dx$

Optimal. Leaf size=25

$$\mathrm{Int}\left(\frac{1}{\left(d+ex^3\right)^2\left(a+b\log\left(cx^n\right)\right)^2},x\right)$$

```
[Out] Unintegrable(1/(e*x^3+d)^2/(a+b*ln(c*x^n))^2,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(d+ex^3\right)^2\left(a+b\log\left(cx^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^3)^2*(a + b*Log[c*x^n])^2),x]
[Out] Defer[Int][1/((d + e*x^3)^2*(a + b*Log[c*x^n])^2), x]
```

Rubi steps

$$\int \frac{1}{\left(d+ex^3\right)^2\left(a+b\log\left(cx^n\right)\right)^2}\,dx=\int \frac{1}{\left(d+ex^3\right)^2\left(a+b\log\left(cx^n\right)\right)^2}\,dx$$

Mathematica [A] time = 25.67, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d+ex^3\right)^2\left(a+b\log\left(cx^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^3)^2*(a + b*Log[c*x^n])^2),x]
[Out] Integrate[1/((d + e*x^3)^2*(a + b*Log[c*x^n])^2), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{a^2e^2x^6+2\,a^2dex^3+a^2d^2+\left(b^2e^2x^6+2\,b^2dex^3+b^2d^2\right)\log\left(cx^n\right)^2+2\left(abe^2x^6+2\,abdex^3+abd^2\right)\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n))^2,x, algorithm="fricas")
[Out] integral(1/(a^2*e^2*x^6 + 2*a^2*d*e*x^3 + a^2*d^2 + (b^2*e^2*x^6 + 2*b^2*d*
e*x^3 + b^2*d^2)*log(c*x^n)^2 + 2*(a*b*e^2*x^6 + 2*a*b*d*e*x^3 + a*b*d^2)*l
og(c*x^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(ex^3+d\right)^2\left(b\log\left(cx^n\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^3 + d)^2*(b*log(c*x^n) + a)^2), x)
```

maple [A] time = 2.49, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\,x^{3}+d\right)^{2} \left(b \ln \left(c\,x^{n}\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^3+d)^2/(b*ln(c*x^n)+a)^2,x)
```

```
[Out] int(1/(e*x^3+d)^2/(b*ln(c*x^n)+a)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{x}{\left(b^{2} e^{2} n \log\left(c\right) + a b e^{2} n\right) x^{6} + b^{2} d^{2} n \log\left(c\right) + a b d^{2} n + 2 \left(b^{2} d e n \log\left(c\right) + a b d e n\right) x^{3} + \left(b^{2} e^{2} n x^{6} + 2 \, b^{2} d e n x^{3} + b^{2} d^{2} n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] -x/((b^2*e^2*n*log(c) + a*b*e^2*n)*x^6 + b^2*d^2*n*log(c) + a*b*d^2*n + 2*(
b^2*d*e*n*log(c) + a*b*d*e*n)*x^3 + (b^2*e^2*n*x^6 + 2*b^2*d*e*n*x^3 + b^2*
d^2*n)*log(x^n)) - integrate((5*e*x^3 - d)/((b^2*e^3*n*log(c) + a*b*e^3*n)*
x^9 + 3*(b^2*d*e^2*n*log(c) + a*b*d*e^2*n)*x^6 + b^2*d^3*n*log(c) + a*b*d^3
*n + 3*(b^2*d^2*e*n*log(c) + a*b*d^2*e*n)*x^3 + (b^2*e^3*n*x^9 + 3*b^2*d*e^
2*n*x^6 + 3*b^2*d^2*e*n*x^3 + b^2*d^3*n)*log(x^n)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{{\left(e\,x^3+d\right)}^2\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d + e*x^3)^2*(a + b*log(c*x^n))^2),x)
```

```
[Out] int(1/((d + e*x^3)^2*(a + b*log(c*x^n))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x**3+d)**2/(a+b*ln(c*x**n))**2,x)
```

```
[Out] Timed out
```

3.329 $\int \frac{x^3(a+b\log(cx^n))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=185

$$\frac{e^4\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^5}+\frac{e^2x^2\left(a+b\log\left(cx^n\right)\right)}{2d^3}-\frac{ex^3\left(a+b\log\left(cx^n\right)\right)}{3d^2}+\frac{x^4\left(a+b\log\left(cx^n\right)\right)}{4d}-\frac{ae^3x}{d^4}-\frac{be^3}{}$$

```
[Out] -a*e^3*x/d^4+b*e^3*n*x/d^4-1/4*b*e^2*n*x^2/d^3+1/9*b*e*n*x^3/d^2-1/16*b*n*x
^4/d-b*e^3*x*ln(c*x^n)/d^4+1/2*e^2*x^2*(a+b*ln(c*x^n))/d^3-1/3*e*x^3*(a+b*l
n(c*x^n))/d^2+1/4*x^4*(a+b*ln(c*x^n))/d+e^4*(a+b*ln(c*x^n))*ln(1+d*x/e)/d^5
+b*e^4*n*polylog(2,-d*x/e)/d^5
```

Rubi [A] time = 0.20, antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$\frac{be^4n\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^5}+\frac{e^4\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^5}+\frac{e^2x^2\left(a+b\log\left(cx^n\right)\right)}{2d^3}-\frac{ex^3\left(a+b\log\left(cx^n\right)\right)}{3d^2}+\frac{x^4\left(a\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] -((a*e^3*x)/d^4) + (b*e^3*n*x)/d^4 - (b*e^2*n*x^2)/(4*d^3) + (b*e*n*x^3)/(9
*d^2) - (b*n*x^4)/(16*d) - (b*e^3*x*Log[c*x^n])/d^4 + (e^2*x^2*(a + b*Log[c
*x^n]))/(2*d^3) - (e*x^3*(a + b*Log[c*x^n]))/(3*d^2) + (x^4*(a + b*Log[c*x^
n]))/(4*d) + (e^4*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])/d^5 + (b*e^4*n*PolyL
og[2, -((d*x)/e)])/d^5
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{d+\frac{e}{x}}\,dx = \int \left(-\frac{e^3\left(a+b\log\left(cx^n\right)\right)}{d^4}+\frac{e^2x\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{ex^2\left(a+b\log\left(cx^n\right)\right)}{d^2}+\frac{x^3\left(a+b\log\right.}{d}\right.$$

$$=\frac{\int x^3\left(a+b\log\left(cx^n\right)\right)\,dx}{d}-\frac{e\int x^2\left(a+b\log\left(cx^n\right)\right)\,dx}{d^2}+\frac{e^2\int x\left(a+b\log\left(cx^n\right)\right)\,dx}{d^3}$$

$$=-\frac{ae^3x}{d^4}-\frac{be^2nx^2}{4d^3}+\frac{benx^3}{9d^2}-\frac{bnx^4}{16d}+\frac{e^2x^2\left(a+b\log\left(cx^n\right)\right)}{2d^3}-\frac{ex^3\left(a+b\log\left(cx^n\right)\right)}{3d^2}+$$

$$=-\frac{ae^3x}{d^4}+\frac{be^3nx}{d^4}-\frac{be^2nx^2}{4d^3}+\frac{benx^3}{9d^2}-\frac{bnx^4}{16d}-\frac{be^3x\log\left(cx^n\right)}{d^4}+\frac{e^2x^2\left(a+b\log\left(cx^n\right)\right)}{2d^3}$$

Mathematica [A] time = 0.11, size = 171, normalized size = 0.92

$$\frac{36d^4x^4\left(a+b\log\left(cx^n\right)\right)-48d^3ex^3\left(a+b\log\left(cx^n\right)\right)+72d^2e^2x^2\left(a+b\log\left(cx^n\right)\right)+144e^4\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(\right.\right.}{144}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] (-144*a*d*e^3*x + 144*b*d*e^3*n*x - 36*b*d^2*e^2*n*x^2 + 16*b*d^3*e*n*x^3 -
 9*b*d^4*n*x^4 - 144*b*d*e^3*x*Log[c*x^n] + 72*d^2*e^2*x^2*(a + b*Log[c*x^n
]) - 48*d^3*e*x^3*(a + b*Log[c*x^n]) + 36*d^4*x^4*(a + b*Log[c*x^n]) + 144*
e^4*(a + b*Log[c*x^n])*Log[1 + (d*x)/e] + 144*b*e^4*n*PolyLog[2, -((d*x)/e)
])/(144*d^5)
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^4\log\left(cx^n\right)+ax^4}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*log(c*x^n) + a*x^4)/(d*x + e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^3}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(d + e/x), x)
```

maple [C] time = 0.23, size = 867, normalized size = 4.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(d+e/x),x)
```

```
[Out] 1/2*b*ln(c)/d^3*x^2*e^2-b*ln(c)/d^4*x*e^3+b*ln(c)*e^4/d^5*ln(d*x+e)-1/3*b*l
n(c)/d^2*e*x^3-b*n*e^4/d^5*dilog(-d*x/e)+b*ln(x^n)*e^4/d^5*ln(d*x+e)-1/3*b*
ln(x^n)/d^2*e*x^3+1/2*b*ln(x^n)/d^3*x^2*e^2-b*ln(x^n)/d^4*x*e^3+1/2*I*b*Pi*
csgn(I*x^n)*csgn(I*c*x^n)^2*e^4/d^5*ln(d*x+e)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)/d^4*x*e^3-1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/
d*x^4+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*x^2*e^2+1/2*I*b*Pi*csgn(I*c*
x^n)^2*csgn(I*c)*e^4/d^5*ln(d*x+e)+1/4*a/d*x^4-1/6*I*b*Pi*csgn(I*c*x^n)^2*c
sgn(I*c)/d^2*e*x^3-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*x*e^3+1/4*b*ln(
x^n)/d*x^4+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*x^2*e^2-1/6*I*b*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)^2/d^2*e*x^3-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/
d^4*x*e^3-1/2*I*b*Pi*csgn(I*c*x^n)^3*e^4/d^5*ln(d*x+e)+1/2*I*b*Pi*csgn(I*c*
x^n)^3/d^4*x*e^3+1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*x^4+205/144*b*n*e^4
/d^5-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*x^2*e^2-1/3*a/d^2*e
*x^3+1/2*a/d^3*x^2*e^2+a*e^4/d^5*ln(d*x+e)+1/4*b*ln(c)/d*x^4+1/6*I*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*e*x^3-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*e^4/d^5*ln(d*x+e)-b*n*e^4/d^5*ln(d*x+e)*ln(-d*x/e)+1/8*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)^2/d*x^4-1/8*I*b*Pi*csgn(I*c*x^n)^3/d*x^4+1/6*I*
b*Pi*csgn(I*c*x^n)^3/d^2*e*x^3-1/4*I*b*Pi*csgn(I*c*x^n)^3/d^3*x^2*e^2-a*e^3
*x/d^4+b*e^3*n*x/d^4-1/16*b*n*x^4/d-1/4*b*e^2*n*x^2/d^3+1/9*b*e*n*x^3/d^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{12}\,a\left(\frac{12\,e^4\log\left(dx+e\right)}{d^5}+\frac{3\,d^3x^4-4\,d^2ex^3+6\,de^2x^2-12\,e^3x}{d^4}\right)+b\int\frac{x^4\log(c)+x^4\log\left(x^n\right)}{dx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e/x),x, algorithm="maxima")
```

```
[Out] 1/12*a*(12*e^4*log(d*x + e)/d^5 + (3*d^3*x^4 - 4*d^2*e*x^3 + 6*d*e^2*x^2 -
12*e^3*x)/d^4) + b*integrate((x^4*log(c) + x^4*log(x^n))/(d*x + e), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e/x),x)
```

```
[Out] int((x^3*(a + b*log(c*x^n)))/(d + e/x), x)
```

sympy [A] time = 164.13, size = 298, normalized size = 1.61

$$\frac{ax^4}{4d}-\frac{aex^3}{3d^2}+\frac{ae^2x^2}{2d^3}+\frac{ae^4\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d^4}-\frac{ae^3x}{d^4}-\frac{bnx^4}{16d}+\frac{bx^4\log(cx^n)}{4d}+\frac{benx^3}{9d^2}-\frac{bex^3\log(cx^n)}{3d^2}-\frac{be^2nx^2}{4d^3}+\frac{b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(d+e/x),x)
```

```
[Out] a*x**4/(4*d) - a*e*x**3/(3*d**2) + a*e**2*x**2/(2*d**3) + a*e**4*Piecewise(
(x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d**4 - a*e**3*x/d**4 - b*n*x**4/(1
6*d) + b*x**4*log(c*x**n)/(4*d) + b*e*n*x**3/(9*d**2) - b*e*x**3*log(c*x**n
)/(3*d**2) - b*e**2*n*x**2/(4*d**3) + b*e**2*x**2*log(c*x**n)/(2*d**3) - b*
e**4*n*Piecewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*
x*exp_polar(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_p
olar(I*pi)/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(
e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_pol
ar(I*pi)/e), True))/d, True))/d**4 + b*e**4*Piecewise((x/e, Eq(d, 0)), (log
(d*x + e)/d, True))*log(c*x**n)/d**4 + b*e**3*n*x/d**4 - b*e**3*x*log(c*x**
n)/d**4
```

3.330 $\int \frac{x^2(a+b\log(cx^n))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=148

$$-\frac{e^3\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{ex^2\left(a+b\log\left(cx^n\right)\right)}{2d^2}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d}+\frac{ae^2x}{d^3}+\frac{be^2x\log\left(cx^n\right)}{d^3}-\frac{be^3n\mathrm{Li}_2\left(\right.}{d^4}$$

```
[Out] a*e^2*x/d^3-b*e^2*n*x/d^3+1/4*b*e*n*x^2/d^2-1/9*b*n*x^3/d+b*e^2*x*ln(c*x^n)
/d^3-1/2*e*x^2*(a+b*ln(c*x^n))/d^2+1/3*x^3*(a+b*ln(c*x^n))/d-e^3*(a+b*ln(c*
x^n))*ln(1+d*x/e)/d^4-b*e^3*n*polylog(2,-d*x/e)/d^4
```

Rubi [A] time = 0.17, antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$-\frac{be^3n\mathrm{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^4}-\frac{e^3\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{ex^2\left(a+b\log\left(cx^n\right)\right)}{2d^2}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d}+\frac{ae^2x}{d^3}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] (a*e^2*x)/d^3 - (b*e^2*n*x)/d^3 + (b*e*n*x^2)/(4*d^2) - (b*n*x^3)/(9*d) + (
b*e^2*x*Log[c*x^n])/d^3 - (e*x^2*(a + b*Log[c*x^n]))/(2*d^2) + (x^3*(a + b*
Log[c*x^n]))/(3*d) - (e^3*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])/d^4 - (b*e^3
*n*PolyLog[2, -((d*x)/e)])/d^4
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d+\frac{e}{x}}\,dx = \int \left(\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{ex\left(a+b\log\left(cx^n\right)\right)}{d^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d}-\frac{e^3\left(a+b\log\left(\right.\right.}{d^3(e+dx}\right.$$

$$=\frac{\int x^2\left(a+b\log\left(cx^n\right)\right)dx}{d}-\frac{e\int x\left(a+b\log\left(cx^n\right)\right)dx}{d^2}+\frac{e^2\int\left(a+b\log\left(cx^n\right)\right)dx}{d^3}-$$

$$=\frac{ae^2x}{d^3}+\frac{benx^2}{4d^2}-\frac{bnx^3}{9d}-\frac{ex^2\left(a+b\log\left(cx^n\right)\right)}{2d^2}+\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d}-\frac{e^3\left(a+b\log\left(\right.\right.}{}$$

$$=\frac{ae^2x}{d^3}-\frac{be^2nx}{d^3}+\frac{benx^2}{4d^2}-\frac{bnx^3}{9d}+\frac{be^2x\log\left(cx^n\right)}{d^3}-\frac{ex^2\left(a+b\log\left(cx^n\right)\right)}{2d^2}+\frac{x^3\left(a+b\log\right.}{3d}$$

Mathematica [A] time = 0.07, size = 142, normalized size = 0.96

$$\frac{12ad^3x^3-18ad^2ex^2-36ae^3\log\left(\frac{dx}{e}+1\right)+36ade^2x+6b\log\left(cx^n\right)\left(dx\left(2d^2x^2-3dex+6e^2\right)-6e^3\log\left(\frac{dx}{e}+1\right)\right)-}{36d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] (36*a*d*e^2*x - 36*b*d*e^2*n*x - 18*a*d^2*e*x^2 + 9*b*d^2*e*n*x^2 + 12*a*d^
3*x^3 - 4*b*d^3*n*x^3 - 36*a*e^3*Log[1 + (d*x)/e] + 6*b*Log[c*x^n]*(d*x*(6*
e^2 - 3*d*e*x + 2*d^2*x^2) - 6*e^3*Log[1 + (d*x)/e]) - 36*b*e^3*n*PolyLog[2
, -((d*x)/e)])/(36*d^4)
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x^n) + a*x^3)/(d*x + e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^2}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(d + e/x), x)
```

maple [C] time = 0.22, size = 693, normalized size = 4.68

$$-\frac{b\,e^{3}\ln(c)\ln\left(dx+e\right)}{d^{4}}-\frac{be\,x^{2}\ln(c)}{2d^{2}}+\frac{b\,e^{2}x\ln(c)}{d^{3}}+\frac{b\,e^{3}n\,\mathrm{dilog}\left(-\frac{dx}{e}\right)}{d^{4}}-\frac{b\,e^{3}\ln\left(x^{n}\right)\ln\left(dx+e\right)}{d^{4}}+\frac{b\,e^{2}x\ln\left(x^{n}\right)}{d^{3}}-\frac{be\,x^{2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(d+e/x),x)
```

```
[Out] -b*ln(c)*e^3/d^4*ln(d*x+e)-1/2*b*ln(c)*e/d^2*x^2+b*ln(c)/d^3*x*e^2+b*n*e^3/
d^4*dilog(-d/e*x)-b*ln(x^n)*e^3/d^4*ln(d*x+e)+b*ln(x^n)/d^3*x*e^2-1/2*b*ln(
x^n)*e/d^2*x^2-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*x^3+1/2*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^3/d^4*ln(d*x+e)+1/2*I*b*Pi*csgn(I
*c*x^n)^2*csgn(I*c)/d^3*x*e^2-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2*x^
2+b*n*e^3/d^4*ln(d*x+e)*ln(-d/e*x)+1/3*a/d*x^3+1/6*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)^2/d*x^3-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2*x^2-1/2*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)^2*e^3/d^4*ln(d*x+e)-49/36*b*n*e^3/d^4-1/2*a*e/d
^2*x^2-a*e^3/d^4*ln(d*x+e)+1/3*b*ln(c)/d*x^3-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3
*x*e^2+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*x^3+1/4*I*b*Pi*csgn(I*c*x^n)^
3*e/d^2*x^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*x*e^2+1/3*b*ln(x^n)/
d*x^3-1/6*I*b*Pi*csgn(I*c*x^n)^3/d*x^3+1/2*I*b*Pi*csgn(I*c*x^n)^3*e^3/d^4*l
n(d*x+e)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^3/d^4*ln(d*x+e)-1/2*I*b*Pi*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*x*e^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*e/d^2*x^2+a*e^2*x/d^3-b*e^2*n*x/d^3-1/9*b*n*x^3/d+1/4*b*e
*n*x^2/d^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{6}\,a\left(\frac{6\,e^{3}\log\left(dx+e\right)}{d^{4}}-\frac{2\,d^{2}x^{3}-3\,dex^{2}+6\,e^{2}x}{d^{3}}\right)+b\int\frac{x^{3}\log(c)+x^{3}\log\left(x^{n}\right)}{dx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e/x),x, algorithm="maxima")
```

```
[Out] -1/6*a*(6*e^3*log(d*x + e)/d^4 - (2*d^2*x^3 - 3*d*e*x^2 + 6*e^2*x)/d^3) + b
*integrate((x^3*log(c) + x^3*log(x^n))/(d*x + e), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^{2}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e/x),x)
```

```
[Out] int((x^2*(a + b*log(c*x^n)))/(d + e/x), x)
```

sympy [A] time = 138.05, size = 248, normalized size = 1.68

$$\frac{ax^3}{3d} - \frac{aex^2}{2d^2} - \frac{ae^3\left(\begin{cases}\frac{x}{e} & \text{for } d = 0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d^3} + \frac{ae^2x}{d^3} - \frac{bnx^3}{9d} + \frac{bx^3\log(cx^n)}{3d} + \frac{benx^2}{4d^2} - \frac{bex^2\log(cx^n)}{2d^2} + \frac{be^3n\left(\begin{cases}\frac{x}{e}\\ \begin{cases}\log(e)\,\mathrm{lo}\\ -\log(e)\\ -G_{2,2}^{2,0}\left(0\right.\end{cases}\end{cases}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(d+e/x),x)
```

```
[Out] a*x**3/(3*d) - a*e*x**2/(2*d**2) - a*e**3*Piecewise((x/e, Eq(d, 0)), (log(d
*x + e)/d, True))/d**3 + a*e**2*x/d**3 - b*n*x**3/(9*d) + b*x**3*log(c*x**n
)/(3*d) + b*e*n*x**2/(4*d**2) - b*e*x**2*log(c*x**n)/(2*d**2) + b*e**3*n*Pi
ecewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_pol
ar(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi
)/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meij
erg(((1, 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/
e), True))/d, True))/d**3 - b*e**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)
/d, True))*log(c*x**n)/d**3 - b*e**2*n*x/d**3 + b*e**2*x*log(c*x**n)/d**3
```

3.331 $\int \frac{x(a+b\log(cx^n))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=107

$$\frac{e^2\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d}-\frac{aex}{d^2}-\frac{bex\log\left(cx^n\right)}{d^2}+\frac{be^2n\text{Li}_2\left(-\frac{dx}{e}\right)}{d^3}+\frac{benx}{d^2}-\frac{bnx^2}{4d}$$

```
[Out] -a*e*x/d^2+b*e*n*x/d^2-1/4*b*n*x^2/d-b*e*x*ln(c*x^n)/d^2+1/2*x^2*(a+b*ln(c*
x^n))/d+e^2*(a+b*ln(c*x^n))*ln(1+d*x/e)/d^3+b*e^2*n*polylog(2,-d*x/e)/d^3
```

Rubi [A] time = 0.12, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$\frac{be^2n\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^3}+\frac{e^2\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d}-\frac{aex}{d^2}-\frac{bex\log\left(cx^n\right)}{d^2}+\frac{benx}{d^2}-\frac{bnx^2}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] -((a*e*x)/d^2) + (b*e*n*x)/d^2 - (b*n*x^2)/(4*d) - (b*e*x*Log[c*x^n])/d^2 +
 (x^2*(a + b*Log[c*x^n]))/(2*d) + (e^2*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])
/d^3 + (b*e^2*n*PolyLog[2, -((d*x)/e)])/d^3
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
```

```
(f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{d+\frac{e}{x}}\,dx &= \int\left(-\frac{e\left(a+b\log\left(cx^n\right)\right)}{d^2}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{d}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{d^2(e+dx)}\right)dx\\ &= \frac{\int x\left(a+b\log\left(cx^n\right)\right)\,dx}{d}-\frac{e\int\left(a+b\log\left(cx^n\right)\right)\,dx}{d^2}+\frac{e^2\int\frac{a+b\log(cx^n)}{e+dx}\,dx}{d^2}\\ &= -\frac{aex}{d^2}-\frac{bnx^2}{4d}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{dx}{e}\right)}{d^3}-\frac{(be)\int\log\left(c\right.}{d^2}\\ &= -\frac{aex}{d^2}+\frac{benx}{d^2}-\frac{bnx^2}{4d}-\frac{bex\log\left(cx^n\right)}{d^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)\log}{d^3}\end{aligned}$$

Mathematica [A] time = 0.05, size = 105, normalized size = 0.98

$$\frac{2ad^2x^2+4ae^2\log\left(\frac{dx}{e}+1\right)-4adex+2b\log\left(cx^n\right)\left(2e^2\log\left(\frac{dx}{e}+1\right)+dx(dx-2e)\right)-bd^2nx^2+4be^2n\text{Li}_2\left(-\frac{dx}{e}\right)+}{4d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] (-4*a*d*e*x + 4*b*d*e*n*x + 2*a*d^2*x^2 - b*d^2*n*x^2 + 4*a*e^2*Log[1 + (d*
x)/e] + 2*b*Log[c*x^n]*(d*x*(-2*e + d*x) + 2*e^2*Log[1 + (d*x)/e]) + 4*b*e^
2*n*PolyLog[2, -((d*x)/e)])/(4*d^3)
```

fricas [F] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\log\left(cx^n\right)+ax^2}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(d*x + e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(d + e/x), x)
```

maple [C] time = 0.20, size = 521, normalized size = 4.87

$$-\frac{b\,e^{2}n\,\mathrm{dilog}\left(-\frac{dx}{e}\right)}{d^{3}}-\frac{i\pi b\,x^{2}\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)}{4d}-\frac{i\pi bex\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^{n}\right)^{2}}{2d^{2}}-\frac{b\,e^{2}n\ln\left(-\frac{dx}{e}\right)\ln\left(d\right.}{d^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(d+e/x),x)
```

```
[Out] -b*n*e^2/d^3*ln(d*x+e)*ln(-d/e*x)-b*n*e^2/d^3*dilog(-d/e*x)-b*ln(c)/d^2*x*e
+b*ln(c)*e^2/d^3*ln(d*x+e)+b*ln(x^n)*e^2/d^3*ln(d*x+e)-b*ln(x^n)/d^2*x*e+1/
2*a/d*x^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*x^2+1/2*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)^2*e^2/d^3*ln(d*x+e)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2
/d^2*x*e+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*x^2-1/4*I*b*Pi*csgn(I*c*x^n
)^3/d*x^2+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^2*x*e-1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2
/d^3*ln(d*x+e)+1/2*b*ln(x^n)/d*x^2-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2
*x*e+a*e^2/d^3*ln(d*x+e)+1/2*b*ln(c)/d*x^2+5/4*b*n*e^2/d^3-1/4*I*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*x^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e
^2/d^3*ln(d*x+e)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3*ln(
d*x+e)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*x*e-a*e*x/d^2+b*e
*n*x/d^2-1/4*b*n*x^2/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{2\,e^{2}\log\left(dx+e\right)}{d^{3}}+\frac{dx^{2}-2\,ex}{d^{2}}\right)+b\int\frac{x^{2}\log(c)+x^{2}\log\left(x^{n}\right)}{dx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e/x),x, algorithm="maxima")
```

```
[Out] 1/2*a*(2*e^2*log(d*x + e)/d^3 + (d*x^2 - 2*e*x)/d^2) + b*integrate((x^2*log
(c) + x^2*log(x^n))/(d*x + e), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e/x),x)
```

```
[Out] int((x*(a + b*log(c*x^n)))/(d + e/x), x)
```

sympy [A] time = 114.15, size = 199, normalized size = 1.86

$$\frac{ax^{2}}{2d}+\frac{ae^{2}\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log\left(dx+e\right)}{d} & \text{otherwise}\end{cases}\right)}{d^{2}}-\frac{aex}{d^{2}}-\frac{bnx^{2}}{4d}+\frac{bx^{2}\log\left(cx^{n}\right)}{2d}-\frac{be^{2}n\left(\left(\begin{cases}\frac{x}{e} \\ \begin{cases}\log\left(e\right)\log\left(x\right)-\mathrm{Li}_{2}\left(\frac{dxe^{i\pi}}{e}\right)\\ -\log\left(e\right)\log\left(\frac{1}{x}\right)-\mathrm{Li}_{2}\left(\frac{dxe^{i\pi}}{e}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle|\,x\right)\log\left(e\right)+G_{2,2}^{0,2}\left(\begin{matrix}1, \ldots\end{matrix}\right.\end{cases}\end{cases}\right.\right.}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(d+e/x),x)
```

```
[Out] a*x**2/(2*d) + a*e**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d*
*2 - a*e*x/d**2 - b*n*x**2/(4*d) + b*x**2*log(c*x**n)/(2*d) - b*e**2*n*Piec
ewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar
(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/
e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijer
g(((1, 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e)
, True))/d, True))/d**2 + b*e**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d
, True))*log(c*x**n)/d**2 + b*e*n*x/d**2 - b*e*x*log(c*x**n)/d**2
```

3.332 $\int \frac{a+b\log(cx^n)}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=69

$$-\frac{e\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}+\frac{ax}{d}+\frac{bx\log\left(cx^n\right)}{d}-\frac{benLi_2\left(-\frac{dx}{e}\right)}{d^2}-\frac{bnx}{d}$$

```
[Out] a*x/d-b*n*x/d+b*x*ln(c*x^n)/d-e*(a+b*ln(c*x^n))*ln(1+d*x/e)/d^2-b*e*n*polyl
og(2,-d*x/e)/d^2
```

Rubi [A] time = 0.08, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {193, 43, 2330, 2295, 2317, 2391}

$$-\frac{ben\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^2}-\frac{e\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2}+\frac{ax}{d}+\frac{bx\log\left(cx^n\right)}{d}-\frac{bnx}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e/x),x]
```

```
[Out] (a*x)/d - (b*n*x)/d + (b*x*Log[c*x^n])/d - (e*(a + b*Log[c*x^n])*Log[1 + (d
*x)/e])/d^2 - (b*e*n*PolyLog[2, -((d*x)/e)])/d^2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 193

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx^n)}{d+\frac{e}{x}}\,dx &= \int \left(\frac{a+b\log(cx^n)}{d}-\frac{e\left(a+b\log(cx^n)\right)}{d(e+dx)}\right)dx\\
&= \frac{\int \left(a+b\log(cx^n)\right)dx}{d}-\frac{e\int \frac{a+b\log(cx^n)}{e+dx}\,dx}{d}\\
&= \frac{ax}{d}-\frac{e\left(a+b\log(cx^n)\right)\log\left(1+\frac{dx}{e}\right)}{d^2}+\frac{b\int \log(cx^n)\,dx}{d}+\frac{(ben)\int \frac{\log\left(1+\frac{dx}{e}\right)}{x}\,dx}{d^2}\\
&= \frac{ax}{d}-\frac{bnx}{d}+\frac{bx\log(cx^n)}{d}-\frac{e\left(a+b\log(cx^n)\right)\log\left(1+\frac{dx}{e}\right)}{d^2}-\frac{ben\mathrm{Li}_2\left(-\frac{dx}{e}\right)}{d^2}
\end{aligned}$$

Mathematica [A] time = 0.03, size = 66, normalized size = 0.96

$$\frac{-ae\log\left(\frac{dx}{e}+1\right)+adx+b\log(cx^n)\left(dx-e\log\left(\frac{dx}{e}+1\right)\right)-ben\mathrm{Li}_2\left(-\frac{dx}{e}\right)-bdnx}{d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e/x),x]
```

```
[Out] (a*d*x - b*d*n*x - a*e*Log[1 + (d*x)/e] + b*Log[c*x^n]*(d*x - e*Log[1 + (d*
x)/e]) - b*e*n*PolyLog[2, -((d*x)/e)])/d^2
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bx\log(cx^n)+ax}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x*log(c*x^n) + a*x)/(d*x + e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(d + e/x), x)
```

maple [C] time = 0.24, size = 343, normalized size = 4.97

$$-\frac{i\pi bx\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)}{2d}+\frac{i\pi bx\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2}{2d}+\frac{i\pi bx\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)^2}{2d}-\frac{i\pi bx\mathrm{csgn}(ic}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(d+e/x),x)
```

```
[Out] b*ln(x^n)/d*x-b*ln(x^n)*e/d^2*ln(d*x+e)-b*n*x/d-b*n*e/d^2+b*n*e/d^2*ln(d*x+
e)*ln(-d/e*x)+b*n*e/d^2*dilog(-d/e*x)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*
e/d^2*ln(d*x+e)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d*x+1/2*I*b*Pi*csgn(I*c*x^n)^3*e
/d^2*ln(d*x+e)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2*ln(d*x+
e)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*x+1/2*I*b*Pi*csgn(I*c*x
^n)^2*csgn(I*c)/d*x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*x-1/2*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2*ln(d*x+e)+b*ln(c)/d*x-b*ln(c)*e/d^2*ln(d*x
+e)+a*x/d-a*e/d^2*ln(d*x+e)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{x}{d} - \frac{e\log\left(dx+e\right)}{d^2}\right) + b\int\frac{x\log(c) + x\log\left(x^n\right)}{dx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x),x, algorithm="maxima")
```

```
[Out] a*(x/d - e*log(d*x + e)/d^2) + b*integrate((x*log(c) + x*log(x^n))/(d*x + e
), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^n\right)}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e/x),x)
```

```
[Out] int((a + b*log(c*x^n))/(d + e/x), x)
```

sympy [A] time = 72.46, size = 144, normalized size = 2.09

$$-\frac{ae\left(\begin{cases}\frac{x}{e} & \text{for}\ d=0\\ \frac{\log\left(dx+e\right)}{d} & \text{otherwise}\end{cases}\right)}{d} + \frac{ax}{d} + \frac{ben\left(\begin{cases}\frac{x}{e} & \\ \frac{\begin{cases}\log\left(e\right)\log\left(x\right) - \operatorname{Li}_{2}\left(\frac{dxe^{i\pi}}{e}\right) & \\ -\log\left(e\right)\log\left(\frac{1}{x}\right) - \operatorname{Li}_{2}\left(\frac{dxe^{i\pi}}{e}\right) & \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log\left(e\right) + G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix}\middle| x\right)\log\left(e\right) - \operatorname{Li}_{2}\left(\frac{dxe^{i\pi}}{e}\right) & \end{cases}}{d} & \end{cases}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e/x),x)
```

```
[Out] -a*e*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d + a*x/d + b*e*n*P
iecewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_po
lar(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*p
i)/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + mei
jerg(((1, 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)
/e), True))/d, True))/d - b*e*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, T
rue))*log(c*x**n)/d - b*n*x/d + b*x*log(c*x**n)/d
```

3.333 $\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x}\,dx$

Optimal. Leaf size=39

$$\frac{\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d}+\frac{bn\text{Li}_2\left(-\frac{dx}{e}\right)}{d}$$

```
[Out] (a+b*ln(c*x^n))*ln(1+d*x/e)/d+b*n*polylog(2,-d*x/e)/d
```

Rubi [A] time = 0.08, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2333, 2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d}+\frac{\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/((d + e/x)*x),x]
```

```
[Out] ((a + b*Log[c*x^n])*Log[1 + (d*x)/e])/d + (b*n*PolyLog[2, -((d*x)/e)])/d
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log\left(cx^n\right)}{\left(d+\frac{e}{x}\right)x}\,dx &= \int \frac{a+b\log\left(cx^n\right)}{e+dx}\,dx\\
&= \frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{dx}{e}\right)}{d}-\frac{(bn)\int \frac{\log\left(1+\frac{dx}{e}\right)}{x}\,dx}{d}\\
&= \frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{dx}{e}\right)}{d}+\frac{bn\text{Li}_2\left(-\frac{dx}{e}\right)}{d}
\end{aligned}$$

Mathematica [A] time = 0.01, size = 37, normalized size = 0.95

$$\frac{\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)+bn\text{Li}_2\left(-\frac{dx}{e}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/((d + e/x)*x),x]
[Out] ((a + b*Log[c*x^n])*Log[1 + (d*x)/e] + b*n*PolyLog[2, -((d*x)/e)])/d
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x,x, algorithm="fricas")
[Out] integral((b*log(c*x^n) + a)/(d*x + e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\log\left(cx^{n}\right)+a}{\left(d+\frac{e}{x}\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)/((d + e/x)*x), x)
```

maple [C] time = 0.19, size = 195, normalized size = 5.00

$$-\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)\ln\left(dx+e\right)}{2d}+\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^{n}\right)^{2}\ln\left(dx+e\right)}{2d}+\frac{i\pi b\,\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(\right.}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(d+e/x)/x,x)
[Out] b*ln(d*x+e)/d*ln(x^n)-b/d*n*ln(d*x+e)*ln(-d/e*x)-b/d*n*dilog(-d/e*x)+1/2*I*
ln(d*x+e)/d*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(d*x+e)/d*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*ln(d*x+e)/d*b*Pi*csgn(I*c*x^n)^3+1/2*I*l
n(d*x+e)/d*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)+ln(d*x+e)/d*b*ln(c)+a*ln(d*x+e)/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b\int\frac{\log(c)+\log\left(x^{n}\right)}{dx+e}\,dx+\frac{a\log\left(dx+e\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x,x, algorithm="maxima")
[Out] b*integrate((log(c) + log(x^n))/(d*x + e), x) + a*log(d*x + e)/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int\frac{a+b\,\ln\left(c\,x^{n}\right)}{x\,\left(d+\frac{e}{x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e/x)),x)
[Out] int((a + b*log(c*x^n))/(x*(d + e/x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\log\left(cx^{n}\right)}{dx + e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e/x)/x,x)
```

```
[Out] Integral((a + b*log(c*x**n))/(d*x + e), x)
```

3.334 $\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x^2}\,dx$

Optimal. Leaf size=44

$$\frac{bn\text{Li}_2\left(-\frac{e}{dx}\right)}{e}-\frac{\log\left(\frac{e}{dx}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e}$$

```
[Out] -ln(1+e/d/x)*(a+b*ln(c*x^n))/e+b*n*polylog(2,-e/d/x)/e
```

Rubi [A] time = 0.07, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2337, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{e}{dx}\right)}{e}-\frac{\log\left(\frac{e}{dx}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/((d + e/x)*x^2),x]
```

```
[Out] -((Log[1 + e/(d*x)]*(a + b*Log[c*x^n]))/e) + (b*n*PolyLog[2, -(e/(d*x))])/e
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log\left(cx^n\right)}{\left(d+\frac{e}{x}\right)x^2}\,dx &= -\frac{\log\left(1+\frac{e}{dx}\right)\left(a+b\log\left(cx^n\right)\right)}{e}+\frac{(bn)\int \frac{\log\left(1+\frac{e}{dx}\right)}{x}\,dx}{e}\\
&= -\frac{\log\left(1+\frac{e}{dx}\right)\left(a+b\log\left(cx^n\right)\right)}{e}+\frac{bn\text{Li}_2\left(-\frac{e}{dx}\right)}{e}
\end{aligned}$$

Mathematica [A] time = 0.03, size = 63, normalized size = 1.43

$$\frac{\left(a+b\log\left(cx^n\right)\right)\left(a+b\log\left(cx^n\right)-2bn\log\left(\frac{dx}{e}+1\right)\right)}{2ben}-\frac{bn\text{Li}_2\left(-\frac{dx}{e}\right)}{e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/((d + e/x)*x^2),x]
```

```
[Out] ((a + b*Log[c*x^n])*(a + b*Log[c*x^n] - 2*b*n*Log[1 + (d*x)/e]))/(2*b*e*n)
- (b*n*PolyLog[2, -((d*x)/e)])/e
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{dx^2+ex},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(d*x^2 + e*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\left(d+\frac{e}{x}\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((d + e/x)*x^2), x)
```

maple [C] time = 0.18, size = 336, normalized size = 7.64

$$-\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln(x)}{2e}+\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln\left(dx+e\right)}{2e}+\frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(i\right.}{2e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(d+e/x)/x^2,x)
```

```
[Out] -b*ln(x^n)/e*ln(d*x+e)+b*ln(x^n)/e*ln(x)-1/2*b*n/e*ln(x)^2+b*n/e*ln(d*x+e)*
ln(-d/e*x)+b*n/e*dilog(-d/e*x)+1/2*I*b*Pi*csgn(I*c*x^n)^3/e*ln(d*x+e)+1/2*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^3/e*ln(x
)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*ln(x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)/e*ln(d*x+e)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*ln(d*
x+e)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*ln(d*x+e)-1/2*I*b*Pi*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)/e*ln(x)-b*ln(c)/e*ln(d*x+e)+b*ln(c)/e*ln(x)-a/e
*ln(d*x+e)+a/e*ln(x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a\left(\frac{\log\left(dx+e\right)}{e}-\frac{\log(x)}{e}\right)+b\int \frac{\log(c)+\log\left(x^n\right)}{dx^2+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^2,x, algorithm="maxima")
```

```
[Out] -a*(log(d*x + e)/e - log(x)/e) + b*integrate((log(c) + log(x^n))/(d*x^2 + e
*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x^2\,\left(d+\frac{e}{x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e/x)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^2*(d + e/x)), x)
```

sympy [C] time = 14.69, size = 156, normalized size = 3.55

$$\frac{2ad\left(\begin{cases}-\frac{x}{e}-\frac{1}{2d} & \text{for } d=0\\ \frac{\log(2dx)}{2d} & \text{otherwise}\end{cases}\right)}{e}-\frac{2ad\left(\begin{cases}\frac{x}{e}+\frac{1}{2d} & \text{for } d=0\\ \frac{\log(2dx+2e)}{2d} & \text{otherwise}\end{cases}\right)}{e}+bn\left(\begin{cases}-\frac{1}{dx}\\ \frac{\begin{cases}\log(d)\log(x)+\mathrm{Li}_2\left(\frac{ee^{i\pi}}{dx}\right)\\ -\log(d)\log\left(\frac{1}{x}\right)+\mathrm{Li}_2\left(\frac{ee^{i\pi}}{dx}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle|x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix}1,1\end{matrix}\right.\end{cases}}{}\end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e/x)/x**2,x)
```

```
[Out] 2*a*d*Piecewise((-x/e - 1/(2*d), Eq(d, 0)), (log(2*d*x)/(2*d), True))/e - 2
*a*d*Piecewise((x/e + 1/(2*d), Eq(d, 0)), (log(2*d*x + 2*e)/(2*d), True))/e
 + b*n*Piecewise((-1/(d*x), Eq(e, 0)), (Piecewise((log(d)*log(x) + polylog(
2, e*exp_polar(I*pi)/(d*x)), Abs(x) < 1), (-log(d)*log(1/x) + polylog(2, e*
exp_polar(I*pi)/(d*x)), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ())
, x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) + polylog(2, e*
exp_polar(I*pi)/(d*x)), True))/e, True)) - b*Piecewise((1/(d*x), Eq(e, 0)),
 (log(d + e/x)/e, True))*log(c*x**n)
```

3.335 $\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x^3}\,dx$

Optimal. Leaf size=95

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2be^2n}+\frac{d\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{a+b\log\left(cx^n\right)}{ex}+\frac{bdn\text{Li}_2\left(-\frac{dx}{e}\right)}{e^2}-\frac{bn}{ex}$$

```
[Out] -b*n/e/x+(-a-b*ln(c*x^n))/e/x-1/2*d*(a+b*ln(c*x^n))^2/b/e^2/n+d*(a+b*ln(c*x
^n))*ln(1+d*x/e)/e^2+b*d*n*polylog(2,-d*x/e)/e^2
```

Rubi [A] time = 0.15, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {263, 44, 2351, 2304, 2301, 2317, 2391}

$$\frac{bdn\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^2}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2be^2n}+\frac{d\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{a+b\log\left(cx^n\right)}{ex}-\frac{bn}{ex}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/((d + e/x)*x^3),x]
```

```
[Out] -((b*n)/(e*x)) - (a + b*Log[c*x^n])/(e*x) - (d*(a + b*Log[c*x^n])^2)/(2*b*e
^2*n) + (d*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])/e^2 + (b*d*n*PolyLog[2, -((
d*x)/e)])/e^2
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
```

```
(f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x^3}\,dx &= \int \left(\frac{a+b\log(cx^n)}{ex^2}-\frac{d\left(a+b\log(cx^n)\right)}{e^2x}+\frac{d^2\left(a+b\log(cx^n)\right)}{e^2(e+dx)}\right)dx\\ &= -\frac{d\int \frac{a+b\log(cx^n)}{x}\,dx}{e^2}+\frac{d^2\int \frac{a+b\log(cx^n)}{e+dx}\,dx}{e^2}+\frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{e}\\ &= -\frac{bn}{ex}-\frac{a+b\log(cx^n)}{ex}-\frac{d\left(a+b\log(cx^n)\right)^2}{2be^2n}+\frac{d\left(a+b\log(cx^n)\right)\log\left(1+\frac{dx}{e}\right)}{e^2}-\frac{(bdn}{}\\ &= -\frac{bn}{ex}-\frac{a+b\log(cx^n)}{ex}-\frac{d\left(a+b\log(cx^n)\right)^2}{2be^2n}+\frac{d\left(a+b\log(cx^n)\right)\log\left(1+\frac{dx}{e}\right)}{e^2}+\frac{bdn\mathrm{I}}{}\end{aligned}$$

Mathematica [A] time = 0.09, size = 88, normalized size = 0.93

$$-\frac{-2d\log\left(\frac{dx}{e}+1\right)\left(a+b\log(cx^n)\right)+\frac{d\left(a+b\log(cx^n)\right)^2}{bn}+\frac{2e\left(a+b\log(cx^n)\right)}{x}-2bdn\mathrm{Li}_2\left(-\frac{dx}{e}\right)+\frac{2ben}{x}}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/((d + e/x)*x^3),x]
```

```
[Out] -1/2*((2*b*e*n)/x + (2*e*(a + b*Log[c*x^n]))/x + (d*(a + b*Log[c*x^n])^2)/(
b*n) - 2*d*(a + b*Log[c*x^n])*Log[1 + (d*x)/e] - 2*b*d*n*PolyLog[2, -((d*x)
/e)])/e^2
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\log(cx^n)+a}{dx^3+ex^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(d*x^3 + e*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{\left(d+\frac{e}{x}\right)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((d + e/x)*x^3), x)
```

maple [C] time = 0.20, size = 504, normalized size = 5.31

$$-\frac{bdn\,\mathrm{dilog}\left(-\frac{dx}{e}\right)}{e^2}-\frac{bd\ln(x)\ln(x^n)}{e^2}+\frac{bd\ln(x^n)\ln(dx+e)}{e^2}-\frac{bd\ln(c)\ln(x)}{e^2}+\frac{bd\ln(c)\ln(dx+e)}{e^2}+\frac{bdn\ln(x)^2}{2e^2}-\frac{i\pi bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(d+e/x)/x^3,x)
```

```
[Out] -b*ln(x^n)*d/e^2*ln(x)+b*ln(x^n)*d/e^2*ln(d*x+e)-b*ln(c)*d/e^2*ln(x)+b*ln(c
)*d/e^2*ln(d*x+e)-b*n*d/e^2*dilog(-d/e*x)+1/2*b*n*d/e^2*ln(x)^2+1/2*I*b*Pi*
csgn(I*c*x^n)^3*d/e^2*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^3*d/e^2*ln(d*x+e)-1/2*
I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^2*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csg
n(I*c)*d/e^2*ln(d*x+e)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^2*ln(d*x+
e)-b*ln(x^n)/e/x-b*n*d/e^2*ln(d*x+e)*ln(-d/e*x)+1/2*I*b*Pi*csgn(I*c*x^n)^3/
e/x-a/e/x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e/x+a*d/e^2*ln(d*x
+e)-a*d/e^2*ln(x)-b*ln(c)/e/x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^2*
ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e/x+1/2*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*d/e^2*ln(x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e/x-1
/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2*ln(d*x+e)-b*n/e/x
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{d\log(dx+e)}{e^2}-\frac{d\log(x)}{e^2}-\frac{1}{ex}\right)+b\int\frac{\log(c)+\log(x^n)}{dx^3+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^3,x, algorithm="maxima")
```

```
[Out] a*(d*log(d*x + e)/e^2 - d*log(x)/e^2 - 1/(e*x)) + b*integrate((log(c) + log
(x^n))/(d*x^3 + e*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^n\right)}{x^3\,\left(d+\frac{e}{x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e/x)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^3*(d + e/x)), x)
```

sympy [A] time = 64.25, size = 197, normalized size = 2.07

$$\frac{ad^2\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{e^2}-\frac{ad\log(x)}{e^2}-\frac{a}{ex}-\frac{bd^2n\left(\begin{cases}\frac{x}{e} & \\ \frac{\begin{cases}\log(e)\log(x)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) & \\ -\log(e)\log\left(\frac{1}{x}\right)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) & \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log(e)-\end{cases}}{d} & \end{cases}\right)}{e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e/x)/x**3,x)
```

```
[Out] a*d**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/e**2 - a*d*log(x)
/e**2 - a/(e*x) - b*d**2*n*Piecewise((x/e, Eq(d, 0)), (Piecewise((log(e)*lo
g(x) - polylog(2, d*x*exp_polar(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) -
polylog(2, d*x*exp_polar(I*pi)/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), (
(0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) - po
lylog(2, d*x*exp_polar(I*pi)/e), True))/d, True))/e**2 + b*d**2*Piecewise((
x/e, Eq(d, 0)), (log(d*x + e)/d, True))*log(c*x**n)/e**2 + b*d*n*log(x)**2/
(2*e**2) - b*d*log(x)*log(c*x**n)/e**2 - b*n/(e*x) - b*log(c*x**n)/(e*x)
```

3.336 $\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x^4}\,dx$

Optimal. Leaf size=135

$$\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2be^3n}-\frac{d^2\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2x}-\frac{a+b\log\left(cx^n\right)}{2ex^2}-\frac{bd^2n\text{Li}_2\left(-\frac{dx}{e}\right)}{e^3}+\frac{bdn}{e^2x}$$

```
[Out] -1/4*b*n/e/x^2+b*d*n/e^2/x+1/2*(-a-b*ln(c*x^n))/e/x^2+d*(a+b*ln(c*x^n))/e^2
/x+1/2*d^2*(a+b*ln(c*x^n))^2/b/e^3/n-d^2*(a+b*ln(c*x^n))*ln(1+d*x/e)/e^3-b*
d^2*n*polylog(2,-d*x/e)/e^3
```

Rubi [A] time = 0.18, antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {263, 44, 2351, 2304, 2301, 2317, 2391}

$$-\frac{bd^2n\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^3}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2be^3n}-\frac{d^2\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2x}-\frac{a+b\log\left(cx^n\right)}{2ex^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/((d + e/x)*x^4),x]
```

```
[Out] -(b*n)/(4*e*x^2) + (b*d*n)/(e^2*x) - (a + b*Log[c*x^n])/(2*e*x^2) + (d*(a +
 b*Log[c*x^n]))/(e^2*x) + (d^2*(a + b*Log[c*x^n])^2)/(2*b*e^3*n) - (d^2*(a
+ b*Log[c*x^n])*Log[1 + (d*x)/e])/e^3 - (b*d^2*n*PolyLog[2, -((d*x)/e)])/e^
3
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x^4}\,dx = \int \left(\frac{a+b\log(cx^n)}{ex^3} - \frac{d\left(a+b\log(cx^n)\right)}{e^2x^2} + \frac{d^2\left(a+b\log(cx^n)\right)}{e^3x} - \frac{d^3\left(a+b\log(cx^n)\right)}{e^3(e+dx)}\right)$$

$$= \frac{d^2\int \frac{a+b\log(cx^n)}{x}\,dx}{e^3} - \frac{d^3\int \frac{a+b\log(cx^n)}{e+dx}\,dx}{e^3} - \frac{d\int \frac{a+b\log(cx^n)}{x^2}\,dx}{e^2} + \frac{\int \frac{a+b\log(cx^n)}{x^3}\,dx}{e}$$

$$= -\frac{bn}{4ex^2} + \frac{bdn}{e^2x} - \frac{a+b\log(cx^n)}{2ex^2} + \frac{d\left(a+b\log(cx^n)\right)}{e^2x} + \frac{d^2\left(a+b\log(cx^n)\right)^2}{2be^3n} - \frac{d^2\left(a+\right.}{}$$

$$= -\frac{bn}{4ex^2} + \frac{bdn}{e^2x} - \frac{a+b\log(cx^n)}{2ex^2} + \frac{d\left(a+b\log(cx^n)\right)}{e^2x} + \frac{d^2\left(a+b\log(cx^n)\right)^2}{2be^3n} - \frac{d^2\left(a+\right.}{}$$

Mathematica [A] time = 0.21, size = 124, normalized size = 0.92

$$-\frac{4d^2\log\left(\frac{dx}{e}+1\right)\left(a+b\log(cx^n)\right) - \frac{2d^2\left(a+b\log(cx^n)\right)^2}{bn} - \frac{4de\left(a+b\log(cx^n)\right)}{x} + \frac{2e^2\left(a+b\log(cx^n)\right)}{x^2} + 4bd^2n\operatorname{Li}_2\left(-\frac{dx}{e}\right) - \frac{4bd}{x}}{4e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/((d + e/x)*x^4),x]
```

```
[Out] -1/4*((b*e^2*n)/x^2 - (4*b*d*e*n)/x + (2*e^2*(a + b*Log[c*x^n]))/x^2 - (4*d
*e*(a + b*Log[c*x^n]))/x - (2*d^2*(a + b*Log[c*x^n])^2)/(b*n) + 4*d^2*(a +
b*Log[c*x^n])*Log[1 + (d*x)/e] + 4*b*d^2*n*PolyLog[2, -((d*x)/e)])/e^3
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{b\log(cx^n)+a}{dx^4+ex^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^4,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(d*x^4 + e*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{\left(d+\frac{e}{x}\right)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((d + e/x)*x^4), x)
```

maple [C] time = 0.20, size = 689, normalized size = 5.10

$$\frac{b\,d^2\ln(c)\ln(x)}{e^3}+\frac{bd\ln(c)}{e^2x}-\frac{b\,d^2\ln(c)\ln(dx+e)}{e^3}-\frac{b\,d^2n\ln(x)^2}{2e^3}-\frac{a\,d^2\ln(dx+e)}{e^3}+\frac{a\,d^2\ln(x)}{e^3}+\frac{ad}{e^2x}+\frac{b\,d^2n\ln\left(-\frac{dx}{e}\right)\ln}{e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(d+e/x)/x^4,x)
```

```
[Out] b*ln(c)*d^2/e^3*ln(x)+b*ln(c)*d/e^2/x-b*ln(c)*d^2/e^3*ln(d*x+e)-1/2*b*n*d^2
/e^3*ln(x)^2+b*n*d^2/e^3*dilog(-d/e*x)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)/e/x^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^3*ln(x)+1/2*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^2/e^3*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^3*d^
2/e^3*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^2/x-1/2*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)^2*d^2/e^3*ln(d*x+e)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
*d^2/e^3*ln(d*x+e)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^2/x-1/2*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^3*ln(x)+1/4*I*b*Pi*csgn(I*c*x^n
)^3/e/x^2-a*d^2/e^3*ln(d*x+e)+a*d^2/e^3*ln(x)+a*d/e^2/x+b*n*d^2/e^3*ln(d*x+
e)*ln(-d/e*x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^3*ln(d*x
+e)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2/x-1/2*a/e/x^2-1/2*
b*ln(c)/e/x^2-1/2*b*ln(x^n)/e/x^2+1/2*I*b*Pi*csgn(I*c*x^n)^3*d^2/e^3*ln(d*x
+e)-b*ln(x^n)*d^2/e^3*ln(d*x+e)+b*ln(x^n)*d^2/e^3*ln(x)+b*ln(x^n)*d/e^2/x-1
/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e/x^2-1/2*I*b*Pi*csgn(I*c*x^n)^3*d/e^
2/x-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e/x^2-1/4*b*n/e/x^2+b*d*n/e^2/x
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a\left(\frac{2\,d^2\log(dx+e)}{e^3}-\frac{2\,d^2\log(x)}{e^3}-\frac{2\,dx-e}{e^2x^2}\right)+b\int\frac{\log(c)+\log(x^n)}{dx^4+ex^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^4,x, algorithm="maxima")
```

```
[Out] -1/2*a*(2*d^2*log(d*x + e)/e^3 - 2*d^2*log(x)/e^3 - (2*d*x - e)/(e^2*x^2))
+ b*integrate((log(c) + log(x^n))/(d*x^4 + e*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln(c\,x^n)}{x^4\,\left(d+\frac{e}{x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^4*(d + e/x)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^4*(d + e/x)), x)
```

sympy [A] time = 88.47, size = 246, normalized size = 1.82

$$-\frac{ad^3\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{e^3}+\frac{ad^2\log(x)}{e^3}+\frac{ad}{e^2x}-\frac{a}{2ex^2}+\frac{bd^3n\left(\begin{cases}\frac{x}{e}\\ \frac{\begin{cases}\log(e)\log(x)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right)\\ -\log(e)\log\left(\frac{1}{x}\right)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle|x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle|x\right)\end{cases}}{d}\end{cases}\right)}{e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e/x)/x**4,x)
```

```
[Out] -a*d**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/e**3 + a*d**2*lo
g(x)/e**3 + a*d/(e**2*x) - a/(2*e*x**2) + b*d**3*n*Piecewise((x/e, Eq(d, 0)
), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar(I*pi)/e), Abs(x) <
1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/e), 1/Abs(x) < 1), (
-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((),
 (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e), True))/d, True))/e
**3 - b*d**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))*log(c*x**n)
/e**3 - b*d**2*n*log(x)**2/(2*e**3) + b*d**2*log(x)*log(c*x**n)/e**3 + b*d*
n/(e**2*x) + b*d*log(c*x**n)/(e**2*x) - b*n/(4*e*x**2) - b*log(c*x**n)/(2*e
*x**2)
```

3.337 $\int \frac{x^3(a+b\log(cx))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=170

$$\frac{e^4\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^5}+\frac{e^2x^2(a+b\log(cx))}{2d^3}-\frac{ex^3(a+b\log(cx))}{3d^2}+\frac{x^4(a+b\log(cx))}{4d}-\frac{ae^3x}{d^4}-\frac{be^3x\log(cx)}{d^4}+\cdots$$

```
[Out] -a*e^3*x/d^4+b*e^3*x/d^4-1/4*b*e^2*x^2/d^3+1/9*b*e*x^3/d^2-1/16*b*x^4/d-b*e
^3*x*ln(c*x)/d^4+1/2*e^2*x^2*(a+b*ln(c*x))/d^3-1/3*e*x^3*(a+b*ln(c*x))/d^2+
1/4*x^4*(a+b*ln(c*x))/d+e^4*(a+b*ln(c*x))*ln(1+d*x/e)/d^5+b*e^4*polylog(2,-
d*x/e)/d^5
```

Rubi [A] time = 0.18, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$\frac{be^4\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^5}+\frac{e^2x^2(a+b\log(cx))}{2d^3}+\frac{e^4\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^5}-\frac{ex^3(a+b\log(cx))}{3d^2}+\frac{x^4(a+b\log(cx))}{4d}\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] -((a*e^3*x)/d^4) + (b*e^3*x)/d^4 - (b*e^2*x^2)/(4*d^3) + (b*e*x^3)/(9*d^2)
- (b*x^4)/(16*d) - (b*e^3*x*Log[c*x])/d^4 + (e^2*x^2*(a + b*Log[c*x]))/(2*d
^3) - (e*x^3*(a + b*Log[c*x]))/(3*d^2) + (x^4*(a + b*Log[c*x]))/(4*d) + (e^
4*(a + b*Log[c*x])*Log[1 + (d*x)/e])/d^5 + (b*e^4*PolyLog[2, -((d*x)/e)])/d
^5
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3(a+b\log(cx))}{d+\frac{e}{x}}\,dx = \int \left(-\frac{e^3(a+b\log(cx))}{d^4}+\frac{e^2x(a+b\log(cx))}{d^3}-\frac{ex^2(a+b\log(cx))}{d^2}+\frac{x^3(a+b\log(cx)}{d}\right.$$

$$=\frac{\int x^3(a+b\log(cx))\,dx}{d}-\frac{e\int x^2(a+b\log(cx))\,dx}{d^2}+\frac{e^2\int x(a+b\log(cx))\,dx}{d^3}-\frac{e^3\int(\ldots}{}$$

$$=-\frac{ae^3x}{d^4}-\frac{be^2x^2}{4d^3}+\frac{bex^3}{9d^2}-\frac{bx^4}{16d}+\frac{e^2x^2(a+b\log(cx))}{2d^3}-\frac{ex^3(a+b\log(cx))}{3d^2}+\frac{x^4(a+b}{4}$$

$$=-\frac{ae^3x}{d^4}+\frac{be^3x}{d^4}-\frac{be^2x^2}{4d^3}+\frac{bex^3}{9d^2}-\frac{bx^4}{16d}-\frac{be^3x\log(cx)}{d^4}+\frac{e^2x^2(a+b\log(cx))}{2d^3}-\frac{ex^3(a\ldots}{}$$

Mathematica [A] time = 0.08, size = 156, normalized size = 0.92

$$\frac{36d^4x^4(a+b\log(cx))-48d^3ex^3(a+b\log(cx))+72d^2e^2x^2(a+b\log(cx))+144e^4\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{144d^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] (-144*a*d*e^3*x + 144*b*d*e^3*x - 36*b*d^2*e^2*x^2 + 16*b*d^3*e*x^3 - 9*b*d
^4*x^4 - 144*b*d*e^3*x*Log[c*x] + 72*d^2*e^2*x^2*(a + b*Log[c*x]) - 48*d^3*
e*x^3*(a + b*Log[c*x]) + 36*d^4*x^4*(a + b*Log[c*x]) + 144*e^4*(a + b*Log[c
*x])*Log[1 + (d*x)/e] + 144*b*e^4*PolyLog[2, -((d*x)/e)])/(144*d^5)
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^4\log(cx)+ax^4}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*log(c*x) + a*x^4)/(d*x + e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\log(cx)+a)x^3}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)*x^3/(d + e/x), x)
```

maple [A] time = 0.07, size = 209, normalized size = 1.23

$$\frac{b\,x^4\ln(cx)}{4d}+\frac{a\,x^4}{4d}-\frac{b\,x^4}{16d}-\frac{be\,x^3\ln(cx)}{3d^2}-\frac{ae\,x^3}{3d^2}+\frac{be\,x^3}{9d^2}+\frac{b\,e^2x^2\ln(cx)}{2d^3}+\frac{a\,e^2x^2}{2d^3}-\frac{b\,e^2x^2}{4d^3}-\frac{b\,e^3x\ln(cx)}{d^4}+\frac{b\,e^4\ln(cx)\ln\left(\frac{c}{}\right.}{d^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x)+a)/(d+e/x),x)
```

```
[Out] 1/4*a/d*x^4-1/3*a/d^2*e*x^3+1/2*a/d^3*e^2*x^2-a/d^4*e^3*x+a*e^4/d^5*ln(c*d*
x+c*e)+1/4*b/d*x^4*ln(c*x)-1/16*b*x^4/d-1/3*b/d^2*e*x^3*ln(c*x)+1/9*b*e*x^3
/d^2+1/2*b/d^3*e^2*x^2*ln(c*x)-1/4*b*e^2*x^2/d^3-b*e^3*x*ln(c*x)/d^4+b*e^3*
x/d^4+b*e^4/d^5*dilog((c*d*x+c*e)/c/e)+b*e^4/d^5*ln(c*x)*ln((c*d*x+c*e)/c/e
)
```

maxima [A] time = 0.87, size = 210, normalized size = 1.24

$$\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\mathrm{Li}_2\left(-\frac{dx}{e}\right)\right)be^4}{d^5}+\frac{9\left(4\,ad^3+\left(4\,d^3\log(c)-d^3\right)b\right)x^4-16\left(3\,ad^2e+\left(3\,d^2e\log(c)-d^2e\right)b\right)x^3+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x))/(d+e/x),x, algorithm="maxima")
```

```
[Out] (log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*e^4/d^5 + 1/144*(9*(4*a*d^3 + (4*
d^3*log(c) - d^3)*b)*x^4 - 16*(3*a*d^2*e + (3*d^2*e*log(c) - d^2*e)*b)*x^3
+ 36*(2*a*d*e^2 + (2*d*e^2*log(c) - d*e^2)*b)*x^2 - 144*(a*e^3 + (e^3*log(c
) - e^3)*b)*x + 12*(3*b*d^3*x^4 - 4*b*d^2*e*x^3 + 6*b*d*e^2*x^2 - 12*b*e^3*
x)*log(x))/d^4 + (b*e^4*log(c) + a*e^4)*log(d*x + e)/d^5
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\left(a+b\,\ln\left(c\,x\right)\right)}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x)))/(d + e/x),x)
```

```
[Out] int((x^3*(a + b*log(c*x)))/(d + e/x), x)
```

sympy [A] time = 161.98, size = 280, normalized size = 1.65

$$\frac{ax^4}{4d}-\frac{aex^3}{3d^2}+\frac{ae^2x^2}{2d^3}+\frac{ae^4\left(\begin{cases}\frac{x}{e} & \text{for}\ d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d^4}-\frac{ae^3x}{d^4}+\frac{bx^4\log(cx)}{4d}-\frac{bx^4}{16d}-\frac{bex^3\log(cx)}{3d^2}+\frac{bex^3}{9d^2}+\frac{be^2x^2\log(cx)}{2d^3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] a*x**4/(4*d) - a*e*x**3/(3*d**2) + a*e**2*x**2/(2*d**3) + a*e**4*Piecewise(
(x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d**4 - a*e**3*x/d**4 + b*x**4*log(
c*x)/(4*d) - b*x**4/(16*d) - b*e*x**3*log(c*x)/(3*d**2) + b*e*x**3/(9*d**2)
 + b*e**2*x**2*log(c*x)/(2*d**3) - b*e**2*x**2/(4*d**3) - b*e**4*Piecewise(
(x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar(I*pi)
/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/e), 1/
Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1,
 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e), True
))/d, True))/d**4 + b*e**4*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True
))*log(c*x)/d**4 - b*e**3*x*log(c*x)/d**4 + b*e**3*x/d**4
```

3.338 $\int \frac{x^2(a+b\log(cx))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=136

$$-\frac{e^3\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^4}-\frac{ex^2(a+b\log(cx))}{2d^2}+\frac{x^3(a+b\log(cx))}{3d}+\frac{ae^2x}{d^3}+\frac{be^2x\log(cx)}{d^3}-\frac{be^3\mathrm{Li}_2\left(-\frac{dx}{e}\right)}{d^4}-\frac{be^2x}{d^3}$$

```
[Out] a*e^2*x/d^3-b*e^2*x/d^3+1/4*b*e*x^2/d^2-1/9*b*x^3/d+b*e^2*x*ln(c*x)/d^3-1/2
*e*x^2*(a+b*ln(c*x))/d^2+1/3*x^3*(a+b*ln(c*x))/d-e^3*(a+b*ln(c*x))*ln(1+d*x
/e)/d^4-b*e^3*polylog(2,-d*x/e)/d^4
```

Rubi [A] time = 0.15, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$-\frac{be^3\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^4}-\frac{e^3\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^4}-\frac{ex^2(a+b\log(cx))}{2d^2}+\frac{x^3(a+b\log(cx))}{3d}+\frac{ae^2x}{d^3}+\frac{be^2x\log(cx)}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] (a*e^2*x)/d^3 - (b*e^2*x)/d^3 + (b*e*x^2)/(4*d^2) - (b*x^3)/(9*d) + (b*e^2*
x*Log[c*x])/d^3 - (e*x^2*(a + b*Log[c*x]))/(2*d^2) + (x^3*(a + b*Log[c*x]))
/(3*d) - (e^3*(a + b*Log[c*x])*Log[1 + (d*x)/e])/d^4 - (b*e^3*PolyLog[2, -(
(d*x)/e)])/d^4
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2(a+b\log(cx))}{d+\frac{e}{x}}\,dx = \int \left(\frac{e^2(a+b\log(cx))}{d^3} - \frac{ex(a+b\log(cx))}{d^2} + \frac{x^2(a+b\log(cx))}{d} - \frac{e^3(a+b\log(cx))}{d^3(e+dx)}\right) d$$

$$= \frac{\int x^2(a+b\log(cx))\,dx}{d} - \frac{e\int x(a+b\log(cx))\,dx}{d^2} + \frac{e^2\int (a+b\log(cx))\,dx}{d^3} - \frac{e^3\int \frac{a+b}{e}}{d}$$

$$= \frac{ae^2x}{d^3} + \frac{bex^2}{4d^2} - \frac{bx^3}{9d} - \frac{ex^2(a+b\log(cx))}{2d^2} + \frac{x^3(a+b\log(cx))}{3d} - \frac{e^3(a+b\log(cx))\log}{d^4}$$

$$= \frac{ae^2x}{d^3} - \frac{be^2x}{d^3} + \frac{bex^2}{4d^2} - \frac{bx^3}{9d} + \frac{be^2x\log(cx)}{d^3} - \frac{ex^2(a+b\log(cx))}{2d^2} + \frac{x^3(a+b\log(cx))}{3d}$$

Mathematica [A] time = 0.07, size = 125, normalized size = 0.92

$$\frac{12d^3x^3(a+b\log(cx)) - 18d^2ex^2(a+b\log(cx)) - 36e^3\log\left(\frac{dx}{e}+1\right)(a+b\log(cx)) + 36ade^2x + 36bde^2x\log(cx}{36d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] (36*a*d*e^2*x - 36*b*d*e^2*x + 9*b*d^2*e*x^2 - 4*b*d^3*x^3 + 36*b*d*e^2*x*L
og[c*x] - 18*d^2*e*x^2*(a + b*Log[c*x]) + 12*d^3*x^3*(a + b*Log[c*x]) - 36*
e^3*(a + b*Log[c*x])*Log[1 + (d*x)/e] - 36*b*e^3*PolyLog[2, -((d*x)/e)])/(3
6*d^4)
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^3\log(cx) + ax^3}{dx+e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x) + a*x^3)/(d*x + e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\log(cx)+a)x^2}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)*x^2/(d + e/x), x)
```

maple [A] time = 0.05, size = 171, normalized size = 1.26

$$\frac{b\,x^3\ln(cx)}{3d}+\frac{a\,x^3}{3d}-\frac{b\,x^3}{9d}-\frac{be\,x^2\ln(cx)}{2d^2}-\frac{ae\,x^2}{2d^2}+\frac{be\,x^2}{4d^2}+\frac{b\,e^2x\ln(cx)}{d^3}-\frac{b\,e^3\ln(cx)\ln\left(\frac{cdx+ce}{ce}\right)}{d^4}+\frac{a\,e^2x}{d^3}-\frac{a\,e^3\ln(cdx+ce)}{d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x)+a)/(d+e/x),x)
```

```
[Out] 1/3*a/d*x^3-1/2*a/d^2*e*x^2+a/d^3*e^2*x-a*e^3/d^4*ln(c*d*x+c*e)+1/3*b/d*x^3
*ln(c*x)-1/9*b*x^3/d-1/2*b/d^2*e*x^2*ln(c*x)+1/4*b*e*x^2/d^2+b*e^2*x*ln(c*x
)/d^3-b*e^2*x/d^3-b*e^3/d^4*dilog((c*d*x+c*e)/c/e)-b*e^3/d^4*ln(c*x)*ln((c*
d*x+c*e)/c/e)
```

maxima [A] time = 0.94, size = 164, normalized size = 1.21

$$-\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\mathrm{Li}_2\left(-\frac{dx}{e}\right)\right)be^3}{d^4}+\frac{4\left(3\,ad^2+\left(3\,d^2\log(c)-d^2\right)b\right)x^3-9\left(2\,ade+\left(2\,de\log(c)-de\right)b\right)x^2+36}{36\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x))/(d+e/x),x, algorithm="maxima")
```

```
[Out] -(log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*e^3/d^4 + 1/36*(4*(3*a*d^2 + (3*
d^2*log(c) - d^2)*b)*x^3 - 9*(2*a*d*e + (2*d*e*log(c) - d*e)*b)*x^2 + 36*(a
*e^2 + (e^2*log(c) - e^2)*b)*x + 6*(2*b*d^2*x^3 - 3*b*d*e*x^2 + 6*b*e^2*x)*
log(x))/d^3 - (b*e^3*log(c) + a*e^3)*log(d*x + e)/d^4
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\left(a+b\,\ln\left(c\,x\right)\right)}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x)))/(d + e/x),x)
```

```
[Out] int((x^2*(a + b*log(c*x)))/(d + e/x), x)
```

sympy [A] time = 136.43, size = 235, normalized size = 1.73

$$\frac{ax^3}{3d}-\frac{aex^2}{2d^2}-\frac{ae^3\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d^3}+\frac{ae^2x}{d^3}+\frac{bx^3\log(cx)}{3d}-\frac{bx^3}{9d}-\frac{bex^2\log(cx)}{2d^2}+\frac{bex^2}{4d^2}+\frac{be^3\left(\begin{cases}\frac{x}{e} \\ \begin{cases}\log(e)\log(x) - \\ -\log(e)\log\left(\frac{1}{x}\right. \\ -G_{2,2}^{2,0}\left(\begin{matrix} 1, \\ 0,0\end{matrix}\right.\end{cases}\end{cases}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] a*x**3/(3*d) - a*e*x**2/(2*d**2) - a*e**3*Piecewise((x/e, Eq(d, 0)), (log(d
*x + e)/d, True))/d**3 + a*e**2*x/d**3 + b*x**3*log(c*x)/(3*d) - b*x**3/(9*
d) - b*e*x**2*log(c*x)/(2*d**2) + b*e*x**2/(4*d**2) + b*e**3*Piecewise((x/e
, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar(I*pi)/e),
 Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/e), 1/Abs(
x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1, 1),
 ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e), True))/d
, True))/d**3 - b*e**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))*l
og(c*x)/d**3 + b*e**2*x*log(c*x)/d**3 - b*e**2*x/d**3
```

3.339 $\int \frac{x(a+b\log(cx))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=98

$$\frac{e^2\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^3}+\frac{x^2(a+b\log(cx))}{2d}-\frac{aex}{d^2}-\frac{bex\log(cx)}{d^2}+\frac{be^2\text{Li}_2\left(-\frac{dx}{e}\right)}{d^3}+\frac{bex}{d^2}-\frac{bx^2}{4d}$$

```
[Out] -a*e*x/d^2+b*e*x/d^2-1/4*b*x^2/d-b*e*x*ln(c*x)/d^2+1/2*x^2*(a+b*ln(c*x))/d+
e^2*(a+b*ln(c*x))*ln(1+d*x/e)/d^3+b*e^2*polylog(2,-d*x/e)/d^3
```

Rubi [A] time = 0.11, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$\frac{be^2\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^3}+\frac{e^2\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^3}+\frac{x^2(a+b\log(cx))}{2d}-\frac{aex}{d^2}-\frac{bex\log(cx)}{d^2}+\frac{bex}{d^2}-\frac{bx^2}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] -((a*e*x)/d^2) + (b*e*x)/d^2 - (b*x^2)/(4*d) - (b*e*x*Log[c*x])/d^2 + (x^2*
(a + b*Log[c*x]))/(2*d) + (e^2*(a + b*Log[c*x])*Log[1 + (d*x)/e])/d^3 + (b*
e^2*PolyLog[2, -((d*x)/e)])/d^3
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
```

```
(f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{x(a+b\log(cx))}{d+\frac{e}{x}}\,dx &= \int \left(-\frac{e(a+b\log(cx))}{d^2}+\frac{x(a+b\log(cx))}{d}+\frac{e^2(a+b\log(cx))}{d^2(e+dx)}\right)dx\\ &= \frac{\int x(a+b\log(cx))\,dx}{d}-\frac{e\int(a+b\log(cx))\,dx}{d^2}+\frac{e^2\int \frac{a+b\log(cx)}{e+dx}\,dx}{d^2}\\ &= -\frac{aex}{d^2}-\frac{bx^2}{4d}+\frac{x^2(a+b\log(cx))}{2d}+\frac{e^2(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d^3}-\frac{(be)\int\log(cx)\,dx}{d^2}\\ &= -\frac{aex}{d^2}+\frac{bex}{d^2}-\frac{bx^2}{4d}-\frac{bex\log(cx)}{d^2}+\frac{x^2(a+b\log(cx))}{2d}+\frac{e^2(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d^3}\end{aligned}$$

Mathematica [A] time = 0.04, size = 99, normalized size = 1.01

$$\frac{e^2\log\left(\frac{dx+e}{e}\right)(a+b\log(cx))}{d^3}+\frac{x^2(a+b\log(cx))}{2d}-\frac{aex}{d^2}-\frac{bex\log(cx)}{d^2}+\frac{be^2\text{Li}_2\left(-\frac{dx}{e}\right)}{d^3}+\frac{bex}{d^2}-\frac{bx^2}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] -((a*e*x)/d^2) + (b*e*x)/d^2 - (b*x^2)/(4*d) - (b*e*x*Log[c*x])/d^2 + (x^2*
(a + b*Log[c*x]))/(2*d) + (e^2*(a + b*Log[c*x])*Log[(e + d*x)/e])/d^3 + (b*
e^2*PolyLog[2, -((d*x)/e)])/d^3
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\log(cx)+ax^2}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x) + a*x^2)/(d*x + e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\log(cx)+a)x}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)*x/(d + e/x), x)
```

maple [A] time = 0.04, size = 129, normalized size = 1.32

$$\frac{b\,x^2\ln(cx)}{2d}+\frac{a\,x^2}{2d}-\frac{b\,x^2}{4d}-\frac{bex\ln(cx)}{d^2}+\frac{b\,e^2\ln(cx)\ln\left(\frac{cdx+ce}{ce}\right)}{d^3}-\frac{aex}{d^2}+\frac{a\,e^2\ln(cdx+ce)}{d^3}+\frac{bex}{d^2}+\frac{b\,e^2\,\mathrm{dilog}\left(\frac{cdx+ce}{ce}\right)}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x)+a)/(d+e/x),x)
```

```
[Out] 1/2*a/d*x^2-a/d^2*e*x+a*e^2/d^3*ln(c*d*x+c*e)+1/2*b/d*x^2*ln(c*x)-1/4*b*x^2
/d-b*e*x*ln(c*x)/d^2+b*e*x/d^2+b*e^2/d^3*dilog((c*d*x+c*e)/c/e)+b*e^2/d^3*l
n(c*x)*ln((c*d*x+c*e)/c/e)
```

maxima [A] time = 0.94, size = 112, normalized size = 1.14

$$\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\mathrm{Li}_2\left(-\frac{dx}{e}\right)\right)be^2}{d^3}+\frac{\left(\left(2\,d\log(c)-d\right)b+2\,ad\right)x^2-4\left(\left(e\log(c)-e\right)b+ae\right)x+2\left(bdx^2-2\,bex\right)}{4\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x))/(d+e/x),x, algorithm="maxima")
```

```
[Out] (log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*e^2/d^3 + 1/4*(((2*d*log(c) - d)*
b + 2*a*d)*x^2 - 4*((e*log(c) - e)*b + a*e)*x + 2*(b*d*x^2 - 2*b*e*x)*log(x
))/d^2 + (b*e^2*log(c) + a*e^2)*log(d*x + e)/d^3
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\ln\left(c\,x\right)\right)}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x)))/(d + e/x),x)
```

```
[Out] int((x*(a + b*log(c*x)))/(d + e/x), x)
```

sympy [A] time = 112.58, size = 189, normalized size = 1.93

$$\frac{ax^2}{2d}+\frac{ae^2\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d^2}-\frac{aex}{d^2}+\frac{bx^2\log(cx)}{2d}-\frac{bx^2}{4d}-\frac{be^2\left(\begin{cases}\frac{x}{e} & \\ \frac{\begin{cases}\log(e)\log(x)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) \\ -\log(e)\log\left(\frac{1}{x}\right)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| \ldots\right. \end{cases}}{d}\end{cases}\right)}{d\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] a*x**2/(2*d) + a*e**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d*
*2 - a*e*x/d**2 + b*x**2*log(c*x)/(2*d) - b*x**2/(4*d) - b*e**2*Piecewise((
x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar(I*pi)/
e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/e), 1/A
```

```
bs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1,
1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e), True)
)/d, True))/d**2 + b*e**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True)
)*log(c*x)/d**2 - b*e*x*log(c*x)/d**2 + b*e*x/d**2
```

3.340 $\int \frac{a+b\log(cx)}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=63

$$-\frac{e\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^2}+\frac{ax}{d}+\frac{bx\log(cx)}{d}-\frac{be\text{Li}_2\left(-\frac{dx}{e}\right)}{d^2}-\frac{bx}{d}$$

```
[Out] a*x/d-b*x/d+b*x*ln(c*x)/d-e*(a+b*ln(c*x))*ln(1+d*x/e)/d^2-b*e*polylog(2,-d*
x/e)/d^2
```

Rubi [A] time = 0.07, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {193, 43, 2330, 2295, 2317, 2391}

$$-\frac{be\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^2}-\frac{e\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^2}+\frac{ax}{d}+\frac{bx\log(cx)}{d}-\frac{bx}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/(d + e/x),x]
```

```
[Out] (a*x)/d - (b*x)/d + (b*x*Log[c*x])/d - (e*(a + b*Log[c*x])*Log[1 + (d*x)/e]
)/d^2 - (b*e*PolyLog[2, -((d*x)/e)])/d^2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 193

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx)}{d+\frac{e}{x}}\,dx &= \int \left(\frac{a+b\log(cx)}{d}-\frac{e(a+b\log(cx))}{d(e+dx)}\right)dx\\
&= \frac{\int (a+b\log(cx))\,dx}{d}-\frac{e\int \frac{a+b\log(cx)}{e+dx}\,dx}{d}\\
&= \frac{ax}{d}-\frac{e(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d^2}+\frac{b\int \log(cx)\,dx}{d}+\frac{(be)\int \frac{\log\left(1+\frac{dx}{e}\right)}{x}\,dx}{d^2}\\
&= \frac{ax}{d}-\frac{bx}{d}+\frac{bx\log(cx)}{d}-\frac{e(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d^2}-\frac{be\mathrm{Li}_2\left(-\frac{dx}{e}\right)}{d^2}
\end{aligned}$$

Mathematica [A] time = 0.03, size = 64, normalized size = 1.02

$$-\frac{e\log\left(\frac{dx+e}{e}\right)(a+b\log(cx))}{d^2}+\frac{ax}{d}+\frac{bx\log(cx)}{d}-\frac{be\mathrm{Li}_2\left(-\frac{dx}{e}\right)}{d^2}-\frac{bx}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/(d + e/x),x]
[Out] (a*x)/d - (b*x)/d + (b*x*Log[c*x])/d - (e*(a + b*Log[c*x])*Log[(e + d*x)/e]
)/d^2 - (b*e*PolyLog[2, -((d*x)/e)])/d^2
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bx\log(cx)+ax}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x),x, algorithm="fricas")
[Out] integral((b*x*log(c*x) + a*x)/(d*x + e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx)+a}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x),x, algorithm="giac")
[Out] integrate((b*log(c*x) + a)/(d + e/x), x)
```

maple [A] time = 0.04, size = 91, normalized size = 1.44

$$\frac{bx\ln(cx)}{d}-\frac{be\ln(cx)\ln\left(\frac{cdx+ce}{ce}\right)}{d^2}+\frac{ax}{d}-\frac{ae\ln(cdx+ce)}{d^2}-\frac{bx}{d}-\frac{be\,\mathrm{dilog}\left(\frac{cdx+ce}{ce}\right)}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x)+a)/(d+e/x),x)
```

```
[Out] a/d*x-a*e/d^2*ln(c*d*x+c*e)+b*x*ln(c*x)/d-b*x/d-b*e/d^2*dilog((c*d*x+c*e)/c
/e)-b*e/d^2*ln(c*x)*ln((c*d*x+c*e)/c/e)
```

maxima [A] time = 0.89, size = 69, normalized size = 1.10

$$-\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\mathrm{Li}_2\left(-\frac{dx}{e}\right)\right)be}{d^2}+\frac{bx\log(x)+\left(b\left(\log(c)-1\right)+a\right)x}{d}-\frac{\left(be\log(c)+ae\right)\log\left(dx+e\right)}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x),x, algorithm="maxima")
```

```
[Out] -(log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*e/d^2 + (b*x*log(x) + (b*(log(c)
 - 1) + a)*x)/d - (b*e*log(c) + a*e)*log(d*x + e)/d^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a+b\,\ln\left(c\,x\right)}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x))/(d + e/x),x)
```

```
[Out] int((a + b*log(c*x))/(d + e/x), x)
```

sympy [A] time = 71.22, size = 138, normalized size = 2.19

$$-\frac{ae\left(\begin{cases}\frac{x}{e} & \text{for}\ d=0\\ \frac{\log\left(dx+e\right)}{d} & \text{otherwise}\end{cases}\right)}{d}+\frac{ax}{d}+\frac{be\left(\begin{cases}\frac{x}{e} & \\ \frac{\begin{cases}\log\left(e\right)\log\left(x\right)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) & \text{fo}\\ -\log\left(e\right)\log\left(\frac{1}{x}\right)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) & \text{fo}\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle|x\right)\log\left(e\right)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle|x\right)\log\left(e\right)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) & \text{o}\end{cases}}{d} & \end{cases}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] -a*e*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d + a*x/d + b*e*Pie
cewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_pola
r(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)
/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meije
rg(((1, 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e
), True))/d, True))/d - b*e*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, Tru
e))*log(c*x)/d + b*x*log(c*x)/d - b*x/d
```

3.341 $\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x}\,dx$

Optimal. Leaf size=36

$$\frac{\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d}+\frac{b\text{Li}_2\left(-\frac{dx}{e}\right)}{d}$$

```
[Out] (a+b*ln(c*x))*ln(1+d*x/e)/d+b*polylog(2,-d*x/e)/d
```

Rubi [A] time = 0.07, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {2333, 2317, 2391}

$$\frac{b\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d}+\frac{\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/((d + e/x)*x),x]
```

```
[Out] ((a + b*Log[c*x])*Log[1 + (d*x)/e])/d + (b*PolyLog[2, -((d*x)/e)])/d
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x}\,dx &= \int \frac{a+b\log(cx)}{e+dx}\,dx\\ &= \frac{(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d}-\frac{b\int \frac{\log\left(1+\frac{dx}{e}\right)}{x}\,dx}{d}\\ &= \frac{(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d}+\frac{b\text{Li}_2\left(-\frac{dx}{e}\right)}{d}\end{aligned}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 0.94

$$\frac{\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))+b\text{Li}_2\left(-\frac{dx}{e}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/((d + e/x)*x),x]
[Out] ((a + b*Log[c*x])*Log[1 + (d*x)/e] + b*PolyLog[2, -((d*x)/e)])/d
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx)+a}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x,x, algorithm="fricas")
[Out] integral((b*log(c*x) + a)/(d*x + e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx)+a}{\left(d+\frac{e}{x}\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x,x, algorithm="giac")
[Out] integrate((b*log(c*x) + a)/((d + e/x)*x), x)
```

maple [A] time = 0.04, size = 62, normalized size = 1.72

$$\frac{b\ln(cx)\ln\left(\frac{cdx+ce}{ce}\right)}{d}+\frac{a\ln(cdx+ce)}{d}+\frac{b\,\text{dilog}\left(\frac{cdx+ce}{ce}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x)+a)/(d+e/x)/x,x)
[Out] a*ln(c*d*x+c*e)/d+b*dilog((c*d*x+c*e)/c/e)/d+b*ln(c*x)*ln((c*d*x+c*e)/c/e)/
d
```

maxima [A] time = 0.85, size = 43, normalized size = 1.19

$$\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\text{Li}_2\left(-\frac{dx}{e}\right)\right)b}{d}+\frac{\left(b\log(c)+a\right)\log(dx+e)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x,x, algorithm="maxima")
[Out] (log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b/d + (b*log(c) + a)*log(d*x + e)/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{a+b\,\ln(c\,x)}{x\,\left(d+\frac{e}{x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x))/(x*(d + e/x)),x)
[Out] int((a + b*log(c*x))/(x*(d + e/x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\log(cx)}{dx + e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x))/(d+e/x)/x,x)
```

```
[Out] Integral((a + b*log(c*x))/(d*x + e), x)
```

3.342 $\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^2}\,dx$

Optimal. Leaf size=41

$$\frac{b\text{Li}_2\left(-\frac{e}{dx}\right)}{e}-\frac{\log\left(\frac{e}{dx}+1\right)(a+b\log(cx))}{e}$$

```
[Out] -ln(1+e/d/x)*(a+b*ln(c*x))/e+b*polylog(2,-e/d/x)/e
```

Rubi [A] time = 0.06, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2337, 2391}

$$\frac{b\text{PolyLog}\left(2,-\frac{e}{dx}\right)}{e}-\frac{\log\left(\frac{e}{dx}+1\right)(a+b\log(cx))}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/((d + e/x)*x^2),x]
```

```
[Out] -((Log[1 + e/(d*x)]*(a + b*Log[c*x]))/e) + (b*PolyLog[2, -(e/(d*x))])/e
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^2}\,dx&=-\frac{\log\left(1+\frac{e}{dx}\right)(a+b\log(cx))}{e}+\frac{b\int \frac{\log\left(1+\frac{e}{dx}\right)}{x}\,dx}{e}\\&=-\frac{\log\left(1+\frac{e}{dx}\right)(a+b\log(cx))}{e}+\frac{b\text{Li}_2\left(-\frac{e}{dx}\right)}{e}\end{aligned}$$

Mathematica [A] time = 0.03, size = 54, normalized size = 1.32

$$\frac{(a+b\log(cx))\left(a+b\log(cx)-2b\log\left(\frac{dx}{e}+1\right)\right)-2b^2\text{Li}_2\left(-\frac{dx}{e}\right)}{2be}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/((d + e/x)*x^2),x]
```

```
[Out] ((a + b*Log[c*x])*(a + b*Log[c*x] - 2*b*Log[1 + (d*x)/e]) - 2*b^2*PolyLog[2
, -((d*x)/e)])/(2*b*e)
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(cx\right)+a}{dx^2+ex},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x) + a)/(d*x^2 + e*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx\right)+a}{\left(d+\frac{e}{x}\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)/((d + e/x)*x^2), x)
```

maple [B] time = 0.05, size = 86, normalized size = 2.10

$$\frac{b\ln\left(cx\right)^2}{2e}-\frac{b\ln\left(cx\right)\ln\left(\frac{cdx+ce}{ce}\right)}{e}+\frac{a\ln\left(cx\right)}{e}-\frac{a\ln\left(cdx+ce\right)}{e}-\frac{b\,\mathrm{dilog}\left(\frac{cdx+ce}{ce}\right)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x)+a)/(d+e/x)/x^2,x)
```

```
[Out] a/e*ln(c*x)-a/e*ln(c*d*x+c*e)+1/2*b*ln(c*x)^2/e-b/e*dilog((c*d*x+c*e)/c/e)-
b/e*ln(c*x)*ln((c*d*x+c*e)/c/e)
```

maxima [A] time = 0.85, size = 67, normalized size = 1.63

$$\frac{b\log(x)^2}{2\,e}-\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\mathrm{Li}_2\left(-\frac{dx}{e}\right)\right)b}{e}-\frac{\left(b\log(c)+a\right)\log\left(dx+e\right)}{e}+\frac{\left(b\log(c)+a\right)\log(x)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^2,x, algorithm="maxima")
```

```
[Out] 1/2*b*log(x)^2/e - (log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b/e - (b*log(c)
+ a)*log(d*x + e)/e + (b*log(c) + a)*log(x)/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a+b\,\ln\left(c\,x\right)}{x^2\,\left(d+\frac{e}{x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x))/(x^2*(d + e/x)),x)
```

```
[Out] int((a + b*log(c*x))/(x^2*(d + e/x)), x)
```

sympy [C] time = 14.26, size = 153, normalized size = 3.73

$$\frac{2ad\left(\begin{cases} -\frac{x}{e}-\frac{1}{2d} & \text{for } d=0 \\ \frac{\log(2dx)}{2d} & \text{otherwise} \end{cases}\right)}{e}-\frac{2ad\left(\begin{cases} \frac{x}{e}+\frac{1}{2d} & \text{for } d=0 \\ \frac{\log(2dx+2e)}{2d} & \text{otherwise} \end{cases}\right)}{e}+b\left(\begin{cases} -\frac{1}{dx} \\ \frac{\begin{cases} \log(d)\log(x)+\mathrm{Li}_2\left(\frac{ee^{i\pi}}{dx}\right) \\ -\log(d)\log\left(\frac{1}{x}\right)+\mathrm{Li}_2\left(\frac{ee^{i\pi}}{dx}\right) \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix}\right. \end{cases}}{e} \end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x))/(d+e/x)/x**2,x)
```

```
[Out] 2*a*d*Piecewise((-x/e - 1/(2*d), Eq(d, 0)), (log(2*d*x)/(2*d), True))/e - 2
*a*d*Piecewise((x/e + 1/(2*d), Eq(d, 0)), (log(2*d*x + 2*e)/(2*d), True))/e
 + b*Piecewise((-1/(d*x), Eq(e, 0)), (Piecewise((log(d)*log(x) + polylog(2,
 e*exp_polar(I*pi)/(d*x)), Abs(x) < 1), (-log(d)*log(1/x) + polylog(2, e*ex
p_polar(I*pi)/(d*x)), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()),
x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) + polylog(2, e*ex
p_polar(I*pi)/(d*x)), True))/e, True)) - b*Piecewise((1/(d*x), Eq(e, 0)), (
log(d + e/x)/e, True))*log(c*x)
```

3.343 $\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^3}\,dx$

Optimal. Leaf size=84

$$-\frac{d(a+b\log(cx))^2}{2be^2}+\frac{d\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{e^2}-\frac{a+b\log(cx)}{ex}+\frac{bd\text{Li}_2\left(-\frac{dx}{e}\right)}{e^2}-\frac{b}{ex}$$

```
[Out] -b/e/x+(-a-b*ln(c*x))/e/x-1/2*d*(a+b*ln(c*x))^2/b/e^2+d*(a+b*ln(c*x))*ln(1+
d*x/e)/e^2+b*d*polylog(2,-d*x/e)/e^2
```

Rubi [A] time = 0.13, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {263, 44, 2351, 2304, 2301, 2317, 2391}

$$\frac{bd\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^2}-\frac{d(a+b\log(cx))^2}{2be^2}+\frac{d\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{e^2}-\frac{a+b\log(cx)}{ex}-\frac{b}{ex}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/((d + e/x)*x^3),x]
```

```
[Out] -(b/(e*x)) - (a + b*Log[c*x])/(e*x) - (d*(a + b*Log[c*x])^2)/(2*b*e^2) + (d
*(a + b*Log[c*x])*Log[1 + (d*x)/e])/e^2 + (b*d*PolyLog[2, -((d*x)/e)])/e^2
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
```

```
(f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^3}\,dx &= \int \left(\frac{a+b\log(cx)}{ex^2}-\frac{d(a+b\log(cx))}{e^2x}+\frac{d^2(a+b\log(cx))}{e^2(e+dx)}\right)dx\\ &= -\frac{d\int \frac{a+b\log(cx)}{x}\,dx}{e^2}+\frac{d^2\int \frac{a+b\log(cx)}{e+dx}\,dx}{e^2}+\frac{\int \frac{a+b\log(cx)}{x^2}\,dx}{e}\\ &= -\frac{b}{ex}-\frac{a+b\log(cx)}{ex}-\frac{d(a+b\log(cx))^2}{2be^2}+\frac{d(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{e^2}-\frac{(bd)\int \frac{\log\left(1+\frac{dx}{e}\right)}{x}}{e^2}\\ &= -\frac{b}{ex}-\frac{a+b\log(cx)}{ex}-\frac{d(a+b\log(cx))^2}{2be^2}+\frac{d(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{e^2}+\frac{bd\text{Li}_2\left(-\frac{dx}{e}\right)}{e^2}\end{aligned}$$

Mathematica [A] time = 0.09, size = 77, normalized size = 0.92

$$-\frac{-2d\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))+\frac{d(a+b\log(cx))^2}{b}+\frac{2e(a+b\log(cx))}{x}-2bd\text{Li}_2\left(-\frac{dx}{e}\right)+\frac{2be}{x}}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/((d + e/x)*x^3),x]
```

```
[Out] -1/2*((2*b*e)/x + (2*e*(a + b*Log[c*x]))/x + (d*(a + b*Log[c*x])^2)/b - 2*d
*(a + b*Log[c*x])*Log[1 + (d*x)/e] - 2*b*d*PolyLog[2, -((d*x)/e)])/e^2
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx)+a}{dx^3+ex^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x) + a)/(d*x^3 + e*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx)+a}{\left(d+\frac{e}{x}\right)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)/((d + e/x)*x^3), x)
```

maple [A] time = 0.05, size = 120, normalized size = 1.43

$$-\frac{bd\ln(cx)^2}{2e^2}+\frac{bd\ln(cx)\ln\left(\frac{cdx+ce}{ce}\right)}{e^2}-\frac{ad\ln(cx)}{e^2}+\frac{ad\ln(cdx+ce)}{e^2}+\frac{bd\,\mathrm{dilog}\left(\frac{cdx+ce}{ce}\right)}{e^2}-\frac{b\ln(cx)}{ex}-\frac{a}{ex}-\frac{b}{ex}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x)+a)/(d+e/x)/x^3,x)
```

```
[Out] -a/e/x-a/e^2*d*ln(c*x)+a/e^2*d*ln(c*d*x+c*e)-b/e/x*ln(c*x)-b/e/x-1/2*b*ln(c
*x)^2/e^2*d+b/e^2*d*dilog((c*d*x+c*e)/c/e)+b/e^2*d*ln(c*x)*ln((c*d*x+c*e)/c
/e)
```

maxima [A] time = 0.93, size = 96, normalized size = 1.14

$$\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\mathrm{Li}_2\left(-\frac{dx}{e}\right)\right)bd}{e^2}+\frac{\left(bd\log(c)+ad\right)\log(dx+e)}{e^2}-\frac{bdx\log(x)^2+2\left(e\log(c)+e\right)b+2\,ae+2}{2\,e^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^3,x, algorithm="maxima")
```

```
[Out] (log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*d/e^2 + (b*d*log(c) + a*d)*log(d*
x + e)/e^2 - 1/2*(b*d*x*log(x)^2 + 2*(e*log(c) + e)*b + 2*a*e + 2*(b*e + (b
*d*log(c) + a*d)*x)*log(x))/(e^2*x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln(c\,x)}{x^3\,\left(d+\frac{e}{x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x))/(x^3*(d + e/x)),x)
```

```
[Out] int((a + b*log(c*x))/(x^3*(d + e/x)), x)
```

sympy [A] time = 62.91, size = 187, normalized size = 2.23

$$\frac{ad^2\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{e^2}-\frac{ad\log(x)}{e^2}-\frac{a}{ex}-\frac{bd^2\left(\begin{cases}\frac{x}{e}\\ \frac{\begin{cases}\log(e)\log(x)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right)\\ -\log(e)\log\left(\frac{1}{x}\right)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle|x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle|x\right)\log(e)-\end{cases}}{d}\end{cases}\right)}{e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x))/(d+e/x)/x**3,x)
```

```
[Out] a*d**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/e**2 - a*d*log(x)
/e**2 - a/(e*x) - b*d**2*Piecewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(
x) - polylog(2, d*x*exp_polar(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - po
lylog(2, d*x*exp_polar(I*pi)/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0
```

```
, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) - poly
log(2, d*x*exp_polar(I*pi)/e), True))/d, True))/e**2 + b*d**2*Piecewise((x/
e, Eq(d, 0)), (log(d*x + e)/d, True))*log(c*x)/e**2 + b*d*log(x)**2/(2*e**2
) - b*d*log(x)*log(c*x)/e**2 - b*log(c*x)/(e*x) - b/(e*x)
```

3.344 $\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^4}\,dx$

Optimal. Leaf size=121

$$\frac{d^2(a+b\log(cx))^2}{2be^3}-\frac{d^2\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{e^3}+\frac{d(a+b\log(cx))}{e^2x}-\frac{a+b\log(cx)}{2ex^2}-\frac{bd^2\mathrm{Li}_2\left(-\frac{dx}{e}\right)}{e^3}+\frac{bd}{e^2x}-\frac{b}{4ex^2}$$

```
[Out] -1/4*b/e/x^2+b*d/e^2/x+1/2*(-a-b*ln(c*x))/e/x^2+d*(a+b*ln(c*x))/e^2/x+1/2*d
^2*(a+b*ln(c*x))^2/b/e^3-d^2*(a+b*ln(c*x))*ln(1+d*x/e)/e^3-b*d^2*polylog(2,
-d*x/e)/e^3
```

Rubi [A] time = 0.16, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {263, 44, 2351, 2304, 2301, 2317, 2391}

$$-\frac{bd^2\mathrm{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^3}+\frac{d^2(a+b\log(cx))^2}{2be^3}-\frac{d^2\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{e^3}+\frac{d(a+b\log(cx))}{e^2x}-\frac{a+b\log(cx)}{2ex^2}+$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/((d + e/x)*x^4),x]
```

```
[Out] -b/(4*e*x^2) + (b*d)/(e^2*x) - (a + b*Log[c*x])/(2*e*x^2) + (d*(a + b*Log[c
*x]))/(e^2*x) + (d^2*(a + b*Log[c*x])^2)/(2*b*e^3) - (d^2*(a + b*Log[c*x])*
Log[1 + (d*x)/e])/e^3 - (b*d^2*PolyLog[2, -((d*x)/e)])/e^3
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^4}\,dx = \int \left(\frac{a+b\log(cx)}{ex^3}-\frac{d(a+b\log(cx))}{e^2x^2}+\frac{d^2(a+b\log(cx))}{e^3x}-\frac{d^3(a+b\log(cx))}{e^3(e+dx)}\right)dx$$

$$=\frac{d^2\int\frac{a+b\log(cx)}{x}\,dx}{e^3}-\frac{d^3\int\frac{a+b\log(cx)}{e+dx}\,dx}{e^3}-\frac{d\int\frac{a+b\log(cx)}{x^2}\,dx}{e^2}+\frac{\int\frac{a+b\log(cx)}{x^3}\,dx}{e}$$

$$=-\frac{b}{4ex^2}+\frac{bd}{e^2x}-\frac{a+b\log(cx)}{2ex^2}+\frac{d(a+b\log(cx))}{e^2x}+\frac{d^2(a+b\log(cx))^2}{2be^3}-\frac{d^2(a+b\log(cx))\,\mathrm{l}}{e^3}$$

$$=-\frac{b}{4ex^2}+\frac{bd}{e^2x}-\frac{a+b\log(cx)}{2ex^2}+\frac{d(a+b\log(cx))}{e^2x}+\frac{d^2(a+b\log(cx))^2}{2be^3}-\frac{d^2(a+b\log(cx))\,\mathrm{l}}{e^3}$$

Mathematica [A] time = 0.15, size = 110, normalized size = 0.91

$$-\frac{4d^2\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))-\frac{2d^2(a+b\log(cx))^2}{b}-\frac{4de(a+b\log(cx))}{x}+\frac{2e^2(a+b\log(cx))}{x^2}+4bd^2\mathrm{Li}_2\left(-\frac{dx}{e}\right)-\frac{4bde}{x}+\frac{be^2}{x^2}}{4e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/((d + e/x)*x^4),x]
```

```
[Out] -1/4*((b*e^2)/x^2 - (4*b*d*e)/x + (2*e^2*(a + b*Log[c*x]))/x^2 - (4*d*e*(a
+ b*Log[c*x]))/x - (2*d^2*(a + b*Log[c*x])^2)/b + 4*d^2*(a + b*Log[c*x])*Lo
g[1 + (d*x)/e] + 4*b*d^2*PolyLog[2, -((d*x)/e)])/e^3
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx)+a}{dx^4+ex^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^4,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x) + a)/(d*x^4 + e*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx)+a}{\left(d+\frac{e}{x}\right)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^4,x, algorithm="giac")
```

[Out] integrate((b*log(c*x) + a)/((d + e/x)*x^4), x)

maple [A] time = 0.05, size = 163, normalized size = 1.35

$$\frac{b\,d^{2}\ln\left(cx\right)^{2}}{2e^{3}}-\frac{b\,d^{2}\ln\left(cx\right)\ln\left(\frac{cdx+ce}{ce}\right)}{e^{3}}+\frac{a\,d^{2}\ln\left(cx\right)}{e^{3}}-\frac{a\,d^{2}\ln\left(cdx+ce\right)}{e^{3}}-\frac{b\,d^{2}\operatorname{dilog}\left(\frac{cdx+ce}{ce}\right)}{e^{3}}+\frac{bd\ln\left(cx\right)}{e^{2}x}+\frac{ad}{e^{2}x}+\frac{bd}{e^{2}x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*ln(c*x)+a)/(d+e/x)/x^4,x)

[Out] -1/2*a/e/x^2+a/e^3*d^2*ln(c*x)+a*d/e^2/x-a/e^3*d^2*ln(c*d*x+c*e)+b/e^2*d/x*ln(c*x)+b*d/e^2/x-1/2*b/e/x^2*ln(c*x)-1/4*b/e/x^2+1/2*b*ln(c*x)^2/e^3*d^2-b/e^3*d^2*dilog((c*d*x+c*e)/c/e)-b/e^3*d^2*ln(c*x)*ln((c*d*x+c*e)/c/e)

maxima [A] time = 0.98, size = 151, normalized size = 1.25

$$-\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\operatorname{Li}_2\left(-\frac{dx}{e}\right)\right)bd^{2}}{e^{3}}-\frac{\left(bd^{2}\log(c)+ad^{2}\right)\log\left(dx+e\right)}{e^{3}}+\frac{2\,bd^{2}x^{2}\log(x)^{2}-2\,ae^{2}-\left(2\,e^{2}\log(c)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*log(c*x))/(d+e/x)/x^4,x, algorithm="maxima")

[Out] -(log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*d^2/e^3 - (b*d^2*log(c) + a*d^2)*log(d*x + e)/e^3 + 1/4*(2*b*d^2*x^2*log(x)^2 - 2*a*e^2 - (2*e^2*log(c) + e^2)*b + 4*(a*d*e + (d*e*log(c) + d*e)*b)*x + 2*(2*b*d*e*x - b*e^2 + 2*(b*d^2*log(c) + a*d^2)*x^2)*log(x))/(e^3*x^2)

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x\right)}{x^4\,\left(d+\frac{e}{x}\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a + b*log(c*x))/(x^4*(d + e/x)),x)

[Out] int((a + b*log(c*x))/(x^4*(d + e/x)), x)

sympy [A] time = 86.81, size = 233, normalized size = 1.93

$$-\frac{ad^{3}\left(\begin{cases}\frac{x}{e} & \text{for}\: d=0\\\frac{\log\left(dx+e\right)}{d} & \text{otherwise}\end{cases}\right)}{e^{3}}+\frac{ad^{2}\log\left(x\right)}{e^{3}}+\frac{ad}{e^{2}x}-\frac{a}{2ex^{2}}+\frac{bd^{3}\left(\begin{cases}\frac{x}{e} \\ \frac{\begin{cases}\log\left(e\right)\log\left(x\right)-\operatorname{Li}_{2}\left(\frac{dxe^{i\pi}}{e}\right)\\-\log\left(e\right)\log\left(\frac{1}{x}\right)-\operatorname{Li}_{2}\left(\frac{dxe^{i\pi}}{e}\right)\\-G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\0,0 & \end{matrix}\middle|x\right)\log\left(e\right)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle|\right.\end{cases}}{d}\end{cases}\right)}{e^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*ln(c*x))/(d+e/x)/x**4,x)

[Out] -a*d**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/e**3 + a*d**2*log(x)/e**3 + a*d/(e**2*x) - a/(2*e*x**2) + b*d**3*Piecewise((x/e, Eq(d, 0)),

```
 (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar(I*pi)/e), Abs(x) < 1)
, (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/e), 1/Abs(x) < 1), (-m
eijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((), (
0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e), True))/d, True))/e**
3 - b*d**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))*log(c*x)/e**3
 - b*d**2*log(x)**2/(2*e**3) + b*d**2*log(x)*log(c*x)/e**3 + b*d*log(c*x)/(
e**2*x) + b*d/(e**2*x) - b*log(c*x)/(2*e*x**2) - b/(4*e*x**2)
```

3.345 $\int \frac{x^{-1+n}\log(ex^n)}{1-ex^n}\,dx$

Optimal. Leaf size=17

$$\frac{\text{Li}_2(1-ex^n)}{en}$$

```
[Out] polylog(2,1-e*x^n)/e/n
```

Rubi [A] time = 0.07, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2336, 2315}

$$\frac{\text{PolyLog}(2,1-ex^n)}{en}$$

Antiderivative was successfully verified.

```
[In] Int[(x^(-1 + n)*Log[e*x^n])/(1 - e*x^n),x]
```

```
[Out] PolyLog[2, 1 - e*x^n]/(e*n)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rubi steps

$$\begin{aligned}\int \frac{x^{-1+n}\log(ex^n)}{1-ex^n}\,dx &= \frac{\text{Subst}\left(\int \frac{\log(ex)}{1-ex}\,dx, x, x^n\right)}{n}\\ &= \frac{\text{Li}_2(1-ex^n)}{en}\end{aligned}$$

Mathematica [A] time = 0.01, size = 17, normalized size = 1.00

$$\frac{\text{Li}_2(1-ex^n)}{en}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^(-1 + n)*Log[e*x^n])/(1 - e*x^n),x]
```

```
[Out] PolyLog[2, 1 - e*x^n]/(e*n)
```

fricas [B] time = 0.41, size = 39, normalized size = 2.29

$$-\frac{n\log(-ex^n+1)\log(x)+\log(ex^n-1)\log(e)+\text{Li}_2(ex^n)}{en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(e*x^n)/(1-e*x^n),x, algorithm="fricas")
```

```
[Out] -(n*log(-e*x^n + 1)*log(x) + log(e*x^n - 1)*log(e) + dilog(e*x^n))/(e*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{x^{n-1}\log\left(ex^{n}\right)}{ex^{n}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(e*x^n)/(1-e*x^n),x, algorithm="giac")
```

```
[Out] integrate(-x^(n - 1)*log(e*x^n)/(e*x^n - 1), x)
```

maple [A] time = 0.04, size = 14, normalized size = 0.82

$$\frac{\operatorname{dilog}\left(e\,x^{n}\right)}{en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(n-1)*ln(e*x^n)/(1-e*x^n),x)
```

```
[Out] 1/e/n*dilog(e*x^n)
```

maxima [B] time = 1.56, size = 52, normalized size = 3.06

$$-\frac{\log(e)\log\left(\frac{ex^{n}-1}{e}\right)}{en}-\frac{\log\left(-ex^{n}+1\right)\log\left(x^{n}\right)+\mathrm{Li}_2\left(ex^{n}\right)}{en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(e*x^n)/(1-e*x^n),x, algorithm="maxima")
```

```
[Out] -log(e)*log((e*x^n - 1)/e)/(e*n) - (log(-e*x^n + 1)*log(x^n) + dilog(e*x^n)
)/(e*n)
```

mupad [B] time = 3.53, size = 13, normalized size = 0.76

$$\frac{\mathrm{Li}_2\left(e\,x^{n}\right)}{e\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(x^(n - 1)*log(e*x^n))/(e*x^n - 1),x)
```

```
[Out] dilog(e*x^n)/(e*n)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-1+n)*ln(e*x**n)/(1-e*x**n),x)
```

```
[Out] Exception raised: TypeError
```

3.346 $\int \frac{x^{-1+n}\log\left(\frac{x^n}{d}\right)}{d-x^n}\,dx$

Optimal. Leaf size=16

$$\frac{\text{Li}_2\left(1-\frac{x^n}{d}\right)}{n}$$

```
[Out] polylog(2,1-x^n/d)/n
```

Rubi [A] time = 0.06, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2336, 2315}

$$\frac{\text{PolyLog}\left(2,1-\frac{x^n}{d}\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[(x^(-1 + n)*Log[x^n/d])/(d - x^n),x]
```

```
[Out] PolyLog[2, 1 - x^n/d]/n
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rubi steps

$$\begin{aligned}\int \frac{x^{-1+n}\log\left(\frac{x^n}{d}\right)}{d-x^n}\,dx &= \frac{\text{Subst}\left(\int \frac{\log\left(\frac{x}{d}\right)}{d-x}\,dx,x,x^n\right)}{n}\\ &= \frac{\text{Li}_2\left(1-\frac{x^n}{d}\right)}{n}\end{aligned}$$

Mathematica [A] time = 0.01, size = 17, normalized size = 1.06

$$\frac{\text{Li}_2\left(\frac{d-x^n}{d}\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^(-1 + n)*Log[x^n/d])/(d - x^n),x]
```

```
[Out] PolyLog[2, (d - x^n)/d]/n
```

fricas [B] time = 0.42, size = 50, normalized size = 3.12

$$-\frac{n\log(x)\log\left(\frac{d-x^n}{d}\right)+\log\left(-d+x^n\right)\log\left(\frac{1}{d}\right)+\text{Li}_2\left(-\frac{d-x^n}{d}+1\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(x^n/d)/(d-x^n),x, algorithm="fricas")
```

```
[Out] -(n*log(x)*log((d - x^n)/d) + log(-d + x^n)*log(1/d) + dilog(-(d - x^n)/d +
 1))/n
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{n-1} \log\left(\frac{x^n}{d}\right)}{d - x^n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(x^n/d)/(d-x^n),x, algorithm="giac")
```

```
[Out] integrate(x^(n - 1)*log(x^n/d)/(d - x^n), x)
```

maple [A] time = 0.04, size = 13, normalized size = 0.81

$$\frac{\mathrm{dilog}\left(\frac{x^n}{d}\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(n-1)*ln(x^n/d)/(d-x^n),x)
```

```
[Out] 1/n*dilog(x^n/d)
```

maxima [B] time = 1.64, size = 45, normalized size = 2.81

$$\frac{\log(d)\log\left(-d + x^n\right)}{n} - \frac{\log\left(x^n\right)\log\left(-\frac{x^n}{d} + 1\right) + \mathrm{Li}_2\left(\frac{x^n}{d}\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(x^n/d)/(d-x^n),x, algorithm="maxima")
```

```
[Out] log(d)*log(-d + x^n)/n - (log(x^n)*log(-x^n/d + 1) + dilog(x^n/d))/n
```

mupad [B] time = 3.48, size = 12, normalized size = 0.75

$$\frac{\mathrm{Li}_2\left(\frac{x^n}{d}\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^(n - 1)*log(x^n/d))/(d - x^n),x)
```

```
[Out] dilog(x^n/d)/n
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-1+n)*ln(x**n/d)/(d-x**n),x)
```

```
[Out] Exception raised: TypeError
```

3.347 $\int \frac{x^{-1+n} \log\left(-\frac{ex^n}{d}\right)}{d+ex^n} dx$

Optimal. Leaf size=20

$$-\frac{\text{Li}_2\left(\frac{ex^n}{d}+1\right)}{en}$$

```
[Out] -polylog(2,1+e*x^n/d)/e/n
```

Rubi [A] time = 0.07, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2336, 2315}

$$-\frac{\text{PolyLog}\left(2, \frac{ex^n}{d}+1\right)}{en}$$

Antiderivative was successfully verified.

```
[In] Int[(x^(-1 + n)*Log[-((e*x^n)/d)])/(d + e*x^n),x]
```

```
[Out] -(PolyLog[2, 1 + (e*x^n)/d]/(e*n))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^{-1+n} \log\left(-\frac{ex^n}{d}\right)}{d+ex^n} dx &= \frac{\text{Subst}\left(\int \frac{\log\left(-\frac{ex}{d}\right)}{d+ex} dx, x, x^n\right)}{n} \\
&= -\frac{\text{Li}_2\left(1+\frac{ex^n}{d}\right)}{en}
\end{aligned}$$

Mathematica [A] time = 0.01, size = 21, normalized size = 1.05

$$-\frac{\text{Li}_2\left(\frac{ex^n+d}{d}\right)}{en}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^(-1 + n)*Log[-((e*x^n)/d)])/(d + e*x^n),x]
```

```
[Out] -(PolyLog[2, (d + e*x^n)/d]/(e*n))
```

fricas [B] time = 0.42, size = 55, normalized size = 2.75

$$\frac{n \log(x) \log\left(\frac{ex^n+d}{d}\right) + \log\left(ex^n+d\right) \log\left(-\frac{e}{d}\right) + \text{Li}_2\left(-\frac{ex^n+d}{d}+1\right)}{en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(-e*x^n/d)/(d+e*x^n),x, algorithm="fricas")
```

```
[Out] (n*log(x)*log((e*x^n + d)/d) + log(e*x^n + d)*log(-e/d) + dilog(-(e*x^n + d
)/d + 1))/(e*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{n-1} \log\left(-\frac{ex^n}{d}\right)}{ex^n + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(-e*x^n/d)/(d+e*x^n),x, algorithm="giac")
```

```
[Out] integrate(x^(n - 1)*log(-e*x^n/d)/(e*x^n + d), x)
```

maple [A] time = 0.04, size = 19, normalized size = 0.95

$$-\frac{\mathrm{dilog}\left(-\frac{e\,x^{n}}{d}\right)}{en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(n-1)*ln(-e*x^n/d)/(d+e*x^n),x)
```

```
[Out] -1/n/e*dilog(-e*x^n/d)
```

maxima [B] time = 1.67, size = 64, normalized size = 3.20

$$-\frac{\left(\log(d) - \log(e)\right)\log\left(\frac{ex^n+d}{e}\right)}{en} + \frac{\log\left(\frac{ex^n}{d} + 1\right)\log\left(-x^n\right) + \mathrm{Li}_2\left(-\frac{ex^n}{d}\right)}{en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(-e*x^n/d)/(d+e*x^n),x, algorithm="maxima")
```

```
[Out] -(log(d) - log(e))*log((e*x^n + d)/e)/(e*n) + (log(e*x^n/d + 1)*log(-x^n) +
 dilog(-e*x^n/d))/(e*n)
```

mupad [B] time = 3.53, size = 18, normalized size = 0.90

$$-\frac{\mathrm{Li}_2\left(-\frac{e\,x^{n}}{d}\right)}{e\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^(n - 1)*log(-(e*x^n)/d))/(d + e*x^n),x)
```

```
[Out] -dilog(-(e*x^n)/d)/(e*n)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-1+n)*ln(-e*x**n/d)/(d+e*x**n),x)
```

```
[Out] Exception raised: TypeError
```

3.348 $\int \frac{\log\left(\frac{a}{x}\right)}{ax-x^2} \, dx$

Optimal. Leaf size=14

$$\frac{\text{Li}_2\left(1-\frac{a}{x}\right)}{a}$$

```
[Out] polylog(2,1-a/x)/a
```

Rubi [A] time = 0.08, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {1593, 2343, 2333, 2315}

$$\frac{\text{PolyLog}\left(2,1-\frac{a}{x}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[Log[a/x]/(a*x - x^2),x]
```

```
[Out] PolyLog[2, 1 - a/x]/a
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rubi steps

$$\begin{aligned}
\int \frac{\log\left(\frac{a}{x}\right)}{ax-x^2} \, dx &= \int \frac{\log\left(\frac{a}{x}\right)}{(a-x)x} \, dx \\
&= -\text{Subst}\left(\int \frac{\log(ax)}{\left(a-\frac{1}{x}\right)x} \, dx, x, \frac{1}{x}\right) \\
&= -\text{Subst}\left(\int \frac{\log(ax)}{-1+ax} \, dx, x, \frac{1}{x}\right) \\
&= \frac{\text{Li}_2\left(1-\frac{a}{x}\right)}{a}
\end{aligned}$$

Mathematica [A] time = 0.00, size = 16, normalized size = 1.14

$$\frac{\text{Li}_2\left(-\frac{a-x}{x}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[a/x]/(a*x - x^2),x]
[Out] PolyLog[2, -((a - x)/x)]/a
```

fricas [A] time = 0.39, size = 13, normalized size = 0.93

$$\frac{\text{Li}_2\left(-\frac{a}{x}+1\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x)/(a*x-x^2),x, algorithm="fricas")
[Out] dilog(-a/x + 1)/a
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log\left(\frac{a}{x}\right)}{ax-x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x)/(a*x-x^2),x, algorithm="giac")
[Out] integrate(log(a/x)/(a*x - x^2), x)
```

maple [A] time = 0.04, size = 11, normalized size = 0.79

$$\frac{\text{dilog}\left(\frac{a}{x}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(a/x)/(a*x-x^2),x)
[Out] 1/a*dilog(a/x)
```

maxima [B] time = 0.75, size = 72, normalized size = 5.14

$$-\left(\frac{\log\left(-a+x\right)}{a}-\frac{\log(x)}{a}\right)\log\left(\frac{a}{x}\right)-\frac{2\,\log\left(-a+x\right)\log(x)-\log(x)^2}{2\,a}+\frac{\log(x)\log\left(-\frac{x}{a}+1\right)+\text{Li}_2\left(\frac{x}{a}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x)/(a*x-x^2),x, algorithm="maxima")
[Out] -(log(-a + x)/a - log(x)/a)*log(a/x) - 1/2*(2*log(-a + x)*log(x) - log(x)^2
)/a + (log(x)*log(-x/a + 1) + dilog(x/a))/a
```

mupad [B] time = 3.46, size = 10, normalized size = 0.71

$$\frac{\text{Li}_2\left(\frac{a}{x}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(a/x)/(a*x - x^2),x)
```

```
[Out] dilog(a/x)/a
```

sympy [C] time = 9.32, size = 71, normalized size = 5.07

$$-\left(\begin{cases}-\frac{1}{x} & \text{for } a = 0\\ \frac{\log\left(\frac{a}{x}-1\right)}{a} & \text{otherwise}\end{cases}\right)\log\left(\frac{a}{x}\right)-\begin{cases}\frac{1}{x}\\ \frac{\begin{cases}i\pi\log\left(x\right)+\operatorname{Li}_2\left(\frac{a}{x}\right) & \text{for } |x|<1\\ -i\pi\log\left(\frac{1}{x}\right)+\operatorname{Li}_2\left(\frac{a}{x}\right) & \text{for } \frac{1}{|x|}<1\\ -i\pi G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)+i\pi G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)+\operatorname{Li}_2\left(\frac{a}{x}\right) & \text{otherwise}\end{cases}}{a}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(a/x)/(a*x-x**2),x)
```

```
[Out] -Piecewise((-1/x, Eq(a, 0)), (log(a/x - 1)/a, True))*log(a/x) - Piecewise((
1/x, Eq(a, 0)), (Piecewise((I*pi*log(x) + polylog(2, a/x), Abs(x) < 1), (-I
*pi*log(1/x) + polylog(2, a/x), 1/Abs(x) < 1), (-I*pi*meijerg(((), (1, 1)),
 ((0, 0), ()), x) + I*pi*meijerg(((1, 1), ()), ((), (0, 0)), x) + polylog(2
, a/x), True))/a, True))
```

3.349 $\int \frac{\log\left(\frac{a}{x^2}\right)}{ax-x^3}\,dx$

Optimal. Leaf size=17

$$\frac{\text{Li}_2\left(1-\frac{a}{x^2}\right)}{2a}$$

```
[Out] 1/2*polylog(2,1-a/x^2)/a
```

Rubi [A] time = 0.09, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {1593, 2343, 2333, 2315}

$$\frac{\text{PolyLog}\left(2,1-\frac{a}{x^2}\right)}{2a}$$

Antiderivative was successfully verified.

```
[In] Int[Log[a/x^2]/(a*x - x^3),x]
```

```
[Out] PolyLog[2, 1 - a/x^2]/(2*a)
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rubi steps

$$\begin{aligned}
\int \frac{\log\left(\frac{a}{x^2}\right)}{ax-x^3}\,dx &= \int \frac{\log\left(\frac{a}{x^2}\right)}{x\left(a-x^2\right)}\,dx\\
&= -\left(\frac{1}{2}\,\text{Subst}\left(\int \frac{\log(ax)}{\left(a-\frac{1}{x}\right)x}\,dx,x,\frac{1}{x^2}\right)\right)\\
&= -\left(\frac{1}{2}\,\text{Subst}\left(\int \frac{\log(ax)}{-1+ax}\,dx,x,\frac{1}{x^2}\right)\right)\\
&= \frac{\text{Li}_2\left(1-\frac{a}{x^2}\right)}{2a}
\end{aligned}$$

Mathematica [A] time = 0.00, size = 21, normalized size = 1.24

$$\frac{\text{Li}_2\left(-\frac{a-x^2}{x^2}\right)}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[a/x^2]/(a*x - x^3),x]
[Out] PolyLog[2, -((a - x^2)/x^2)]/(2*a)
```

fricas [A] time = 0.40, size = 14, normalized size = 0.82

$$\frac{\text{Li}_2\left(-\frac{a}{x^2}+1\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x^2)/(-x^3+a*x),x, algorithm="fricas")
[Out] 1/2*dilog(-a/x^2 + 1)/a
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{\log\left(\frac{a}{x^2}\right)}{x^3-ax}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x^2)/(-x^3+a*x),x, algorithm="giac")
[Out] integrate(-log(a/x^2)/(x^3 - a*x), x)
```

maple [A] time = 0.04, size = 12, normalized size = 0.71

$$\frac{\text{dilog}\left(\frac{a}{x^2}\right)}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(a/x^2)/(-x^3+a*x),x)
[Out] 1/2/a*dilog(a/x^2)
```

maxima [B] time = 0.61, size = 81, normalized size = 4.76

$$-\frac{1}{2}\left(\frac{\log\left(x^2-a\right)}{a}-\frac{2\,\log(x)}{a}\right)\log\left(\frac{a}{x^2}\right)-\frac{\log\left(x^2-a\right)\log(x)-\log(x)^2}{a}+\frac{2\,\log(x)\log\left(-\frac{x^2}{a}+1\right)+\text{Li}_2\left(\frac{x^2}{a}\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x^2)/(-x^3+a*x),x, algorithm="maxima")
[Out] -1/2*(log(x^2 - a)/a - 2*log(x)/a)*log(a/x^2) - (log(x^2 - a)*log(x) - log(
x)^2)/a + 1/2*(2*log(x)*log(-x^2/a + 1) + dilog(x^2/a))/a
```

mupad [B] time = 3.50, size = 11, normalized size = 0.65

$$\frac{\text{Li}_2\left(\frac{a}{x^2}\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(a/x^2)/(a*x - x^3),x)
```

```
[Out] dilog(a/x^2)/(2*a)
```

sympy [C] time = 11.31, size = 78, normalized size = 4.59

$$-\frac{\begin{cases} i\pi\log(x)+\frac{\operatorname{Li}_2\left(\frac{a}{x^2}\right)}{2} & \text{for } |x|<1 \\ -i\pi\log\left(\frac{1}{x}\right)+\frac{\operatorname{Li}_2\left(\frac{a}{x^2}\right)}{2} & \text{for } \frac{1}{|x|}<1 \\ -i\pi G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)+i\pi G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix}\middle| x\right)+\frac{\operatorname{Li}_2\left(\frac{a}{x^2}\right)}{2} & \text{otherwise} \end{cases}}{a}-\frac{\log\left(\frac{a}{x^2}\right)\log\left(\frac{a}{x^2}-1\right)}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(a/x**2)/(-x**3+a*x),x)
```

```
[Out] -Piecewise((I*pi*log(x) + polylog(2, a/x**2)/2, Abs(x) < 1), (-I*pi*log(1/x
) + polylog(2, a/x**2)/2, 1/Abs(x) < 1), (-I*pi*meijerg(((), (1, 1)), ((0,
0), ()), x) + I*pi*meijerg(((1, 1), ()), ((), (0, 0)), x) + polylog(2, a/x*
*2)/2, True))/a - log(a/x**2)*log(a/x**2 - 1)/(2*a)
```

3.350 $\int \frac{\log(ax^{1-n})}{ax-x^n}\,dx$

Optimal. Leaf size=26

$$-\frac{\text{Li}_2\left(1-ax^{1-n}\right)}{a(1-n)}$$

```
[Out] -polylog(2,1-a*x^(1-n))/a/(1-n)
```

Rubi [A] time = 0.09, antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {1593, 2336, 2315}

$$-\frac{\text{PolyLog}\left(2,1-ax^{1-n}\right)}{a(1-n)}$$

Antiderivative was successfully verified.

```
[In] Int[Log[a*x^(1 - n)]/(a*x - x^n),x]
```

```
[Out] -(PolyLog[2, 1 - a*x^(1 - n)]/(a*(1 - n)))
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rubi steps

$$\begin{aligned}
\int \frac{\log\left(ax^{1-n}\right)}{ax-x^n}\,dx &= \int \frac{x^{-n}\log\left(ax^{1-n}\right)}{-1+ax^{1-n}}\,dx\\
&= \frac{\text{Subst}\left(\int \frac{\log(ax)}{-1+ax}\,dx,x,x^{1-n}\right)}{1-n}\\
&= -\frac{\text{Li}_2\left(1-ax^{1-n}\right)}{a(1-n)}
\end{aligned}$$

Mathematica [A] time = 0.01, size = 23, normalized size = 0.88

$$\frac{\text{Li}_2\left(1-ax^{1-n}\right)}{a(n-1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[a*x^(1 - n)]/(a*x - x^n),x]
```

```
[Out] PolyLog[2, 1 - a*x^(1 - n)]/(a*(-1 + n))
```

fricas [B] time = 0.42, size = 89, normalized size = 3.42

$$\frac{2\,(n-1)\log(a)\log(x)-\left(n^{2}-2\,n+1\right)\log(x)^{2}+2\,(n-1)\log(x)\log\left(\frac{a-x^{n-1}}{a}\right)-2\,\log(a)\log\left(-a+x^{n-1}\right)+2\,\mathrm{Li}_2\left(\right.}{2\,(an-a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a*x^(1-n))/(a*x-x^n),x, algorithm="fricas")
```

```
[Out] 1/2*(2*(n - 1)*log(a)*log(x) - (n^2 - 2*n + 1)*log(x)^2 + 2*(n - 1)*log(x)*
log((a - x^(n - 1))/a) - 2*log(a)*log(-a + x^(n - 1)) + 2*dilog(-(a - x^(n
- 1))/a + 1))/(a*n - a)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log\left(ax^{-n+1}\right)}{ax-x^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a*x^(1-n))/(a*x-x^n),x, algorithm="giac")
```

```
[Out] integrate(log(a*x^(-n + 1))/(a*x - x^n), x)
```

maple [F] time = 0.93, size = 0, normalized size = 0.00

$$\int \frac{\ln\left(a\,x^{-n+1}\right)}{ax-x^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(a*x^(-n+1))/(a*x-x^n),x)
```

```
[Out] int(ln(a*x^(-n+1))/(a*x-x^n),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log\left(ax^{-n+1}\right)}{ax-x^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a*x^(1-n))/(a*x-x^n),x, algorithm="maxima")
```

```
[Out] integrate(log(a*x^(-n + 1))/(a*x - x^n), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\ln\left(a\,x^{1-n}\right)}{a\,x-x^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(a*x^(1 - n))/(a*x - x^n),x)
```

```
[Out] int(log(a*x^(1 - n))/(a*x - x^n), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log\left(axx^{-n}\right)}{ax-x^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(a*x**(1-n))/(a*x-x**n),x)
```

```
[Out] Integral(log(a*x*x**(-n))/(a*x - x**n), x)
```

3.351 $\int (fx)^{-1+m}(d+ex^m)^3\left(a+b\log\left(cx^n\right)\right)dx$

Optimal. Leaf size=171

$$\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^4\left(a+b\log\left(cx^n\right)\right)}{4em}-\frac{bd^4nx^{1-m}\log(x)(fx)^{m-1}}{4em}-\frac{bd^3nx(fx)^{m-1}}{m^2}-\frac{3bd^2enx^{m+1}(fx)^{m-1}}{4m^2}-\frac{bde^2n}{}$$

```
[Out] -b*d^3*n*x*(f*x)^(-1+m)/m^2-3/4*b*d^2*e*n*x^(1+m)*(f*x)^(-1+m)/m^2-1/3*b*d*
e^2*n*x^(1+2*m)*(f*x)^(-1+m)/m^2-1/16*b*e^3*n*x^(1+3*m)*(f*x)^(-1+m)/m^2-1/
4*b*d^4*n*x^(1-m)*(f*x)^(-1+m)*ln(x)/e/m+1/4*x^(1-m)*(f*x)^(-1+m)*(d+e*x^m)
^4*(a+b*ln(c*x^n))/e/m
```

Rubi [A] time = 0.21, antiderivative size = 171, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {2339, 2338, 266, 43}

$$\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^4\left(a+b\log\left(cx^n\right)\right)}{4em}-\frac{3bd^2enx^{m+1}(fx)^{m-1}}{4m^2}-\frac{bd^4nx^{1-m}\log(x)(fx)^{m-1}}{4em}-\frac{bd^3nx(fx)^{m-1}}{m^2}-\frac{bde^2n}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d^3*n*x*(f*x)^(-1 + m))/m^2) - (3*b*d^2*e*n*x^(1 + m)*(f*x)^(-1 + m))/
(4*m^2) - (b*d*e^2*n*x^(1 + 2*m)*(f*x)^(-1 + m))/(3*m^2) - (b*e^3*n*x^(1 +
3*m)*(f*x)^(-1 + m))/(16*m^2) - (b*d^4*n*x^(1 - m)*(f*x)^(-1 + m)*Log[x])/(
4*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^4*(a + b*Log[c*x^n]))/(4*e*m
)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rubi steps

$$\int (fx)^{-1+m}(d+ex^m)^3(a+b\log(cx^n))\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int x^{-1+m}(d+ex^m)^3(a+b\log(cx^n))\,dx$$
$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^4(a+b\log(cx^n))}{4em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)}{4em}$$
$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^4(a+b\log(cx^n))}{4em} - \left(bnx^{1-m}(fx)^{-1+m}\right)$$
$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^4(a+b\log(cx^n))}{4em} - \left(bnx^{1-m}(fx)^{-1+m}\right)$$
$$= -\frac{bd^3nx(fx)^{-1+m}}{m^2} - \frac{3bd^2enx^{1+m}(fx)^{-1+m}}{4m^2} - \frac{bde^2nx^{1+2m}(fx)^{-1+m}}{3m^2}$$

Mathematica [A] time = 0.16, size = 140, normalized size = 0.82

$$\frac{(fx)^m\left(12am\left(4d^3+6d^2ex^m+4de^2x^{2m}+e^3x^{3m}\right)+12bm\log(cx^n)\left(4d^3+6d^2ex^m+4de^2x^{2m}+e^3x^{3m}\right)-bn\left(48\right.\right.}{48fm^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] ((f*x)^m*(12*a*m*(4*d^3 + 6*d^2*e*x^m + 4*d*e^2*x^(2*m) + e^3*x^(3*m)) - b*
n*(48*d^3 + 36*d^2*e*x^m + 16*d*e^2*x^(2*m) + 3*e^3*x^(3*m)) + 12*b*m*(4*d^
3 + 6*d^2*e*x^m + 4*d*e^2*x^(2*m) + e^3*x^(3*m))*Log[c*x^n]))/(48*f*m^2)
```

fricas [A] time = 0.43, size = 193, normalized size = 1.13

$$\frac{3\left(4\,be^3mn\log(x)+4\,be^3m\log(c)+4\,ae^3m-be^3n\right)f^{m-1}x^{4\,m}+16\left(3\,bde^2mn\log(x)+3\,bde^2m\log(c)+3\,ade^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/48*(3*(4*b*e^3*m*n*log(x) + 4*b*e^3*m*log(c) + 4*a*e^3*m - b*e^3*n)*f^(m
- 1)*x^(4*m) + 16*(3*b*d*e^2*m*n*log(x) + 3*b*d*e^2*m*log(c) + 3*a*d*e^2*m
- b*d*e^2*n)*f^(m - 1)*x^(3*m) + 36*(2*b*d^2*e*m*n*log(x) + 2*b*d^2*e*m*log
(c) + 2*a*d^2*e*m - b*d^2*e*n)*f^(m - 1)*x^(2*m) + 48*(b*d^3*m*n*log(x) + b
*d^3*m*log(c) + a*d^3*m - b*d^3*n)*f^(m - 1)*x^m)/m^2
```

giac [B] time = 0.78, size = 351, normalized size = 2.05

$$\frac{bd^3\frac{1}{f}^m x^m|f|^{2\,m}\log(c)}{fm}+\frac{bd^3f^mnx^m\log(x)}{fm}+\frac{3\,bd^2f^mnx^{2\,m}e\log(x)}{2\,fm}+\frac{ad^3\frac{1}{f}^m x^m|f|^{2\,m}}{fm}+\frac{3\,bd^2f^mx^{2\,m}e\log(c)}{2\,fm}+\frac{bdf^m}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*d^3*(1/f)^m*x^m*abs(f)^(2*m)*log(c)/(f*m) + b*d^3*f^m*n*x^m*log(x)/(f*m)
+ 3/2*b*d^2*f^m*n*x^(2*m)*e*log(x)/(f*m) + a*d^3*(1/f)^m*x^m*abs(f)^(2*m)/(
f*m) + 3/2*b*d^2*f^m*x^(2*m)*e*log(c)/(f*m) + b*d*f^m*n*x^(3*m)*e^2*log(x)/
(f*m) - b*d^3*f^m*n*x^m/(f*m^2) + 3/2*a*d^2*f^m*x^(2*m)*e/(f*m) - 3/4*b*d^2
*f^m*n*x^(2*m)*e/(f*m^2) + b*d*f^m*x^(3*m)*e^2*log(c)/(f*m) + 1/4*b*f^m*n*x
^(4*m)*e^3*log(x)/(f*m) + a*d*f^m*x^(3*m)*e^2/(f*m) - 1/3*b*d*f^m*n*x^(3*m)
```

```
*e^2/(f*m^2) + 1/4*b*f^m*x^(4*m)*e^3*log(c)/(f*m) + 1/4*a*f^m*x^(4*m)*e^3/(
f*m) - 1/16*b*f^m*n*x^(4*m)*e^3/(f*m^2)
```

maple [C] time = 0.32, size = 806, normalized size = 4.71

$$\frac{\left(6d^2e\,x^m + 4d\,e^2x^{2m} + e^3x^{3m} + 4d^3\right) bx\,\mathrm{e}^{\frac{(m-1)\left(-i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ix)\mathrm{csgn}(ifx)+i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ifx)^2+i\pi\,\mathrm{csgn}(ix)\mathrm{csgn}(ifx)^2-i\pi\mathrm{csgn}(ifx)^3+2\ln(f)+2\ln(}{2}}}{4m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(d+e*x^m)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/4*b*(e^3*(x^m)^3+4*d*e^2*(x^m)^2+6*d^2*e*x^m+4*d^3)*x/m*exp(1/2*(m-1)*(-I
*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(
I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x)))*ln(x^n)+1/48*(-48*b
*d^3*n+48*a*d^3*m-3*b*e^3*n*(x^m)^3+12*a*e^3*(x^m)^3*m-24*I*Pi*b*d^3*m*csgn
(I*c*x^n)^3+6*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^3*m+6*I*Pi*b*e^3
*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^3*m-24*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^m)^
2*m+72*ln(c)*b*d^2*e*x^m*m+48*ln(c)*b*d*e^2*(x^m)^2*m-36*I*Pi*b*d^2*e*csgn(
I*c*x^n)^3*x^m*m-24*I*Pi*b*d^3*m*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+48*ln(
c)*b*d^3*m-6*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^3*m+24*I*
Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2*m+24*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I
*c)*m+36*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m+36*I*Pi*b*d^2*e*csg
n(I*c*x^n)^2*csgn(I*c)*x^m*m+48*a*d*e^2*(x^m)^2*m-24*I*Pi*b*d*e^2*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2*m-36*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)*x^m*m+72*a*d^2*e*x^m*m-16*b*d*e^2*n*(x^m)^2-36*b*d^2*e*n*x^m+
12*ln(c)*b*e^3*(x^m)^3*m+24*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^
2*m+24*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^2*m-6*I*Pi*b*e^3*csgn(I
*c*x^n)^3*(x^m)^3*m)*x/m^2*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*
f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*
f*x)^3+2*ln(f)+2*ln(x)))
```

maxima [A] time = 0.75, size = 253, normalized size = 1.48

$$\frac{be^3f^{m-1}x^{4\,m}\log\left(cx^n\right)}{4\,m}+\frac{bde^2f^{m-1}x^{3\,m}\log\left(cx^n\right)}{m}+\frac{3\,bd^2ef^{m-1}x^{2\,m}\log\left(cx^n\right)}{2\,m}+\frac{ae^3f^{m-1}x^{4\,m}}{4\,m}-\frac{be^3f^{m-1}nx^{4\,m}}{16\,m^2}+\frac{ade^2f^{m-}}{m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] 1/4*b*e^3*f^(m - 1)*x^(4*m)*log(c*x^n)/m + b*d*e^2*f^(m - 1)*x^(3*m)*log(c*
x^n)/m + 3/2*b*d^2*e*f^(m - 1)*x^(2*m)*log(c*x^n)/m + 1/4*a*e^3*f^(m - 1)*x
^(4*m)/m - 1/16*b*e^3*f^(m - 1)*n*x^(4*m)/m^2 + a*d*e^2*f^(m - 1)*x^(3*m)/m
 - 1/3*b*d*e^2*f^(m - 1)*n*x^(3*m)/m^2 + 3/2*a*d^2*e*f^(m - 1)*x^(2*m)/m -
3/4*b*d^2*e*f^(m - 1)*n*x^(2*m)/m^2 - b*d^3*f^(m - 1)*n*x^m/m^2 + (f*x)^m*b
*d^3*log(c*x^n)/(f*m) + (f*x)^m*a*d^3/(f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(f\,x\right)}^{m-1}\,{\left(d+e\,x^m\right)}^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m - 1)*(d + e*x^m)^3*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^(m - 1)*(d + e*x^m)^3*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.352 $\int (fx)^{-1+m}(d+ex^m)^2(a+b\log(cx^n))\,dx$

Optimal. Leaf size=142

$$\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^3(a+b\log(cx^n))}{3em}-\frac{bd^3nx^{1-m}\log(x)(fx)^{m-1}}{3em}-\frac{bd^2nx(fx)^{m-1}}{m^2}-\frac{bdenx^{m+1}(fx)^{m-1}}{2m^2}-\frac{be^2nx^{2m}}{9}$$

```
[Out] -b*d^2*n*x*(f*x)^(-1+m)/m^2-1/2*b*d*e*n*x^(1+m)*(f*x)^(-1+m)/m^2-1/9*b*e^2*
n*x^(1+2*m)*(f*x)^(-1+m)/m^2-1/3*b*d^3*n*x^(1-m)*(f*x)^(-1+m)*ln(x)/e/m+1/3
*x^(1-m)*(f*x)^(-1+m)*(d+e*x^m)^3*(a+b*ln(c*x^n))/e/m
```

Rubi [A] time = 0.20, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {2339, 2338, 266, 43}

$$\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^3(a+b\log(cx^n))}{3em}-\frac{bd^3nx^{1-m}\log(x)(fx)^{m-1}}{3em}-\frac{bd^2nx(fx)^{m-1}}{m^2}-\frac{bdenx^{m+1}(fx)^{m-1}}{2m^2}-\frac{be^2nx^{2m}}{9}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d^2*n*x*(f*x)^(-1 + m))/m^2) - (b*d*e*n*x^(1 + m)*(f*x)^(-1 + m))/(2*m
^2) - (b*e^2*n*x^(1 + 2*m)*(f*x)^(-1 + m))/(9*m^2) - (b*d^3*n*x^(1 - m)*(f*
x)^(-1 + m)*Log[x])/(3*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^3*(a +
b*Log[c*x^n]))/(3*e*m)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rubi steps

$$\int (fx)^{-1+m}(d+ex^m)^2\left(a+b\log(cx^n)\right)dx = \left(x^{1-m}(fx)^{-1+m}\right)\int x^{-1+m}(d+ex^m)^2\left(a+b\log(cx^n)\right)dx$$
$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^3\left(a+b\log(cx^n)\right)}{3em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)}{3em}$$
$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^3\left(a+b\log(cx^n)\right)}{3em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)}{}$$
$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^3\left(a+b\log(cx^n)\right)}{3em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)}{}$$
$$= -\frac{bd^2nx(fx)^{-1+m}}{m^2} - \frac{bdenx^{1+m}(fx)^{-1+m}}{2m^2} - \frac{be^2nx^{1+2m}(fx)^{-1+m}}{9m^2} -$$

Mathematica [A] time = 0.12, size = 101, normalized size = 0.71

$$\frac{(fx)^m\left(6am\left(3d^2+3dex^m+e^2x^{2m}\right)+6bm\log(cx^n)\left(3d^2+3dex^m+e^2x^{2m}\right)-bn\left(18d^2+9dex^m+2e^2x^{2m}\right)\right)}{18fm^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] ((f*x)^m*(6*a*m*(3*d^2 + 3*d*e*x^m + e^2*x^(2*m)) - b*n*(18*d^2 + 9*d*e*x^m
 + 2*e^2*x^(2*m)) + 6*b*m*(3*d^2 + 3*d*e*x^m + e^2*x^(2*m))*Log[c*x^n]))/(1
8*f*m^2)
```

fricas [A] time = 0.43, size = 135, normalized size = 0.95

$$\frac{2\left(3\,be^2mn\log(x)+3\,be^2m\log(c)+3\,ae^2m-be^2n\right)f^{m-1}x^{3\,m}+9\left(2\,bdemn\log(x)+2\,bdem\log(c)+2\,adem-\right.}{18\,m^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/18*(2*(3*b*e^2*m*n*log(x) + 3*b*e^2*m*log(c) + 3*a*e^2*m - b*e^2*n)*f^(m
- 1)*x^(3*m) + 9*(2*b*d*e*m*n*log(x) + 2*b*d*e*m*log(c) + 2*a*d*e*m - b*d*e
*n)*f^(m - 1)*x^(2*m) + 18*(b*d^2*m*n*log(x) + b*d^2*m*log(c) + a*d^2*m - b
*d^2*n)*f^(m - 1)*x^m)/m^2
```

giac [A] time = 0.74, size = 257, normalized size = 1.81

$$\frac{bd^2\frac{1}{f}^m x^m\left|f\right|^{2\,m}\log(c)}{fm}+\frac{bd^2f^mnx^m\log(x)}{fm}+\frac{bdf^mnx^{2\,m}e\log(x)}{fm}+\frac{ad^2\frac{1}{f}^m x^m\left|f\right|^{2\,m}}{fm}+\frac{bdf^mx^{2\,m}e\log(c)}{fm}+\frac{bf^mnx^{3\,m}e}{3\,f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*d^2*(1/f)^m*x^m*abs(f)^(2*m)*log(c)/(f*m) + b*d^2*f^m*n*x^m*log(x)/(f*m)
+ b*d*f^m*n*x^(2*m)*e*log(x)/(f*m) + a*d^2*(1/f)^m*x^m*abs(f)^(2*m)/(f*m) +
 b*d*f^m*x^(2*m)*e*log(c)/(f*m) + 1/3*b*f^m*n*x^(3*m)*e^2*log(x)/(f*m) - b*
d^2*f^m*n*x^m/(f*m^2) + a*d*f^m*x^(2*m)*e/(f*m) - 1/2*b*d*f^m*n*x^(2*m)*e/(
f*m^2) + 1/3*b*f^m*x^(3*m)*e^2*log(c)/(f*m) + 1/3*a*f^m*x^(3*m)*e^2/(f*m) -
 1/9*b*f^m*n*x^(3*m)*e^2/(f*m^2)
```

maple [C] time = 0.25, size = 616, normalized size = 4.34

$$\frac{\left(3de\,x^{m}+e^{2}x^{2m}+3d^{2}\right)bx\,\mathrm{e}^{\frac{(m-1)\left(-i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ix)\mathrm{csgn}(ifx)+i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ifx)^{2}+i\pi\,\mathrm{csgn}(ix)\mathrm{csgn}(ifx)^{2}-i\pi\mathrm{csgn}(ifx)^{3}+2\ln(f)+2\ln(x)\right)}{2}}\ln\left(x^{n}\right)}{3m}+\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(d+e*x^m)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/3*b*(e^2*(x^m)^2+3*d*e*x^m+3*d^2)*x/m*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn
(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2
-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x)))*ln(x^n)+1/18*(9*I*Pi*b*d*e*csgn(I*x^n
)*csgn(I*c*x^n)^2*x^m*m+9*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*m+9*I*Pi*b
*d^2*csgn(I*c*x^n)^2*csgn(I*c)*m-9*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*x^m*m+9*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m-3*I*Pi*b*e^2*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2*m+3*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn
(I*c)*(x^m)^2*m-9*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^m*m+3*I*Pi*b*e^2*csgn(I*x^n)
*csgn(I*c*x^n)^2*(x^m)^2*m-9*I*Pi*b*d^2*csgn(I*c*x^n)^3*m-9*I*Pi*b*d^2*m*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^m)^2*m+6*
ln(c)*b*e^2*(x^m)^2*m+18*ln(c)*b*d*e*x^m*m+6*a*e^2*(x^m)^2*m-2*b*e^2*n*(x^m
)^2+18*b*d^2*m*ln(c)+18*a*d*e*x^m*m-9*b*d*e*n*x^m+18*a*d^2*m-18*b*d^2*n)*x/
m^2*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csg
n(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x))
)
```

maxima [A] time = 0.70, size = 180, normalized size = 1.27

$$\frac{be^{2}f^{m-1}x^{3m}\log\left(cx^{n}\right)}{3m}+\frac{bdef^{m-1}x^{2m}\log\left(cx^{n}\right)}{m}+\frac{ae^{2}f^{m-1}x^{3m}}{3m}-\frac{be^{2}f^{m-1}nx^{3m}}{9m^{2}}+\frac{adef^{m-1}x^{2m}}{m}-\frac{bdef^{m-1}nx^{2m}}{2m^{2}}-\frac{bd^{2}f^{\cdot}}{\cdot}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] 1/3*b*e^2*f^(m - 1)*x^(3*m)*log(c*x^n)/m + b*d*e*f^(m - 1)*x^(2*m)*log(c*x^
n)/m + 1/3*a*e^2*f^(m - 1)*x^(3*m)/m - 1/9*b*e^2*f^(m - 1)*n*x^(3*m)/m^2 +
a*d*e*f^(m - 1)*x^(2*m)/m - 1/2*b*d*e*f^(m - 1)*n*x^(2*m)/m^2 - b*d^2*f^(m
- 1)*n*x^m/m^2 + (f*x)^m*b*d^2*log(c*x^n)/(f*m) + (f*x)^m*a*d^2/(f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(f\,x\right)^{m-1}\,\left(d+e\,x^m\right)^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m - 1)*(d + e*x^m)^2*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^(m - 1)*(d + e*x^m)^2*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.353 $\int (fx)^{-1+m}(d+ex^m)\left(a+b\log\left(cx^n\right)\right)dx$

Optimal. Leaf size=90

$$\frac{d(fx)^m\left(a+b\log\left(cx^n\right)\right)}{fm}+\frac{ex^m(fx)^m\left(a+b\log\left(cx^n\right)\right)}{2fm}-\frac{bdn(fx)^m}{fm^2}-\frac{benx^m(fx)^m}{4fm^2}$$

```
[Out] -b*d*n*(f*x)^m/f/m^2-1/4*b*e*n*x^m*(f*x)^m/f/m^2+d*(f*x)^m*(a+b*ln(c*x^n))/
f/m+1/2*e*x^m*(f*x)^m*(a+b*ln(c*x^n))/f/m
```

Rubi [A] time = 0.12, antiderivative size = 113, normalized size of antiderivative = 1.26, number of steps used = 5, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2339, 2338, 266, 43}

$$\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^2\left(a+b\log\left(cx^n\right)\right)}{2em}-\frac{bd^2nx^{1-m}\log(x)(fx)^{m-1}}{2em}-\frac{bdnx(fx)^{m-1}}{m^2}-\frac{benx^{m+1}(fx)^{m-1}}{4m^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d*n*x*(f*x)^(-1 + m))/m^2) - (b*e*n*x^(1 + m)*(f*x)^(-1 + m))/(4*m^2)
- (b*d^2*n*x^(1 - m)*(f*x)^(-1 + m)*Log[x])/(2*e*m) + (x^(1 - m)*(f*x)^(-1
+ m)*(d + e*x^m)^2*(a + b*Log[c*x^n]))/(2*e*m)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rubi steps

$$\int (fx)^{-1+m}(d+ex^m)\left(a+b\log(cx^n)\right)dx = \left(x^{1-m}(fx)^{-1+m}\right)\int x^{-1+m}(d+ex^m)\left(a+b\log(cx^n)\right)dx$$
$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^2\left(a+b\log(cx^n)\right)}{2em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{(d\cdot}{}}{2em}$$
$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^2\left(a+b\log(cx^n)\right)}{2em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\text{Sub}}{2em}$$
$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^2\left(a+b\log(cx^n)\right)}{2em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\text{Sub}}{}$$
$$= -\frac{bdnx(fx)^{-1+m}}{m^2} - \frac{benx^{1+m}(fx)^{-1+m}}{4m^2} - \frac{bd^2nx^{1-m}(fx)^{-1+m}\log(x)}{2em} +$$

Mathematica [A] time = 0.07, size = 61, normalized size = 0.68

$$\frac{(fx)^m\left(2am(2d+ex^m)+2bm\log(cx^n)(2d+ex^m)-bn(4d+ex^m)\right)}{4fm^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)*(a + b*Log[c*x^n]),x]
```

```
[Out] ((f*x)^m*(2*a*m*(2*d + e*x^m) - b*n*(4*d + e*x^m) + 2*b*m*(2*d + e*x^m)*Log
[c*x^n]))/(4*f*m^2)
```

fricas [A] time = 0.44, size = 76, normalized size = 0.84

$$\frac{\left(2\,bemn\log(x)+2\,bem\log(c)+2\,aem-ben\right)f^{m-1}x^{2\,m}+4\left(bdmn\log(x)+bdm\log(c)+adm-bdn\right)f^{m-1}x^m}{4\,m^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/4*((2*b*e*m*n*log(x) + 2*b*e*m*log(c) + 2*a*e*m - b*e*n)*f^(m - 1)*x^(2*m
) + 4*(b*d*m*n*log(x) + b*d*m*log(c) + a*d*m - b*d*n)*f^(m - 1)*x^m)/m^2
```

giac [A] time = 0.54, size = 166, normalized size = 1.84

$$\frac{bd\frac{1}{f}^m x^m\left|f\right|^{2\,m}\log(c)}{fm}+\frac{bdf^m nx^m\log(x)}{fm}+\frac{bf^m nx^{2\,m}e\log(x)}{2\,fm}+\frac{ad\frac{1}{f}^m x^m\left|f\right|^{2\,m}}{fm}+\frac{bf^m x^{2\,m}e\log(c)}{2\,fm}-\frac{bdf^m nx^m}{fm^2}+\frac{af^m x^{2\,m}}{2\,fm}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*d*(1/f)^m*x^m*abs(f)^(2*m)*log(c)/(f*m) + b*d*f^m*n*x^m*log(x)/(f*m) + 1/
2*b*f^m*n*x^(2*m)*e*log(x)/(f*m) + a*d*(1/f)^m*x^m*abs(f)^(2*m)/(f*m) + 1/2
*b*f^m*x^(2*m)*e*log(c)/(f*m) - b*d*f^m*n*x^m/(f*m^2) + 1/2*a*f^m*x^(2*m)*e
/(f*m) - 1/4*b*f^m*n*x^(2*m)*e/(f*m^2)
```

maple [C] time = 0.23, size = 426, normalized size = 4.73

$$\frac{(e\,x^m+2d)\,bx\,\mathrm{e}^{\frac{(m-1)\left(-i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ix)\mathrm{csgn}(ifx)+i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ifx)^2+i\pi\,\mathrm{csgn}(ix)\mathrm{csgn}(ifx)^2-i\pi\mathrm{csgn}(ifx)^3+2\ln(f)+2\ln(x)\right)}{2}}\ln(x^n)}{2m}+\frac{\left(-i\pi bem\,x^m\mathrm{c}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(d+e*x^m)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/2*b*(e*x^m+2*d)*x/m*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+
I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^
3+2*ln(f)+2*ln(x)))*ln(x^n)+1/4*(I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m
-I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m-I*Pi*b*e*csgn(I*c*x^n)^
3*x^m*m+I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m+2*I*Pi*b*d*csgn(I*x^n)*csg
n(I*c*x^n)^2*m-2*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*m-2*I*Pi*b*d*
csgn(I*c*x^n)^3*m+2*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*m+2*ln(c)*b*e*x^m*m+
4*b*d*m*ln(c)+2*x^m*a*e*m-x^m*b*e*n+4*a*d*m-4*b*d*n)*x/m^2*exp(1/2*(m-1)*(-
I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn
(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x)))
```

maxima [A] time = 0.73, size = 109, normalized size = 1.21

$$\frac{bef^{m-1}x^{2m}\log(cx^n)}{2m}+\frac{aef^{m-1}x^{2m}}{2m}-\frac{bef^{m-1}nx^{2m}}{4m^2}-\frac{bdf^{m-1}nx^m}{m^2}+\frac{\left(fx\right)^m bd\log(cx^n)}{fm}+\frac{\left(fx\right)^m ad}{fm}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] 1/2*b*e*f^(m - 1)*x^(2*m)*log(c*x^n)/m + 1/2*a*e*f^(m - 1)*x^(2*m)/m - 1/4*
b*e*f^(m - 1)*n*x^(2*m)/m^2 - b*d*f^(m - 1)*n*x^m/m^2 + (f*x)^m*b*d*log(c*x
^n)/(f*m) + (f*x)^m*a*d/(f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(f\,x\right)^{m-1}\,\left(d+e\,x^m\right)\,\left(a+b\,\ln\left(c\,x^n\right)\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m - 1)*(d + e*x^m)*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^(m - 1)*(d + e*x^m)*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.354 $\int (fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)dx$

Optimal. Leaf size=38

$$\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{fm}-\frac{bn(fx)^m}{fm^2}$$

```
[Out] -b*n*(f*x)^m/f/m^2+(f*x)^m*(a+b*ln(c*x^n))/f/m
```

Rubi [A] time = 0.02, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2304}

$$\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{fm}-\frac{bn(fx)^m}{fm^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*(f*x)^m)/(f*m^2)) + ((f*x)^m*(a + b*Log[c*x^n]))/(f*m)
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int (fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)dx=-\frac{bn(fx)^m}{fm^2}+\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{fm}$$

Mathematica [A] time = 0.01, size = 29, normalized size = 0.76

$$\frac{(fx)^m\left(am+bm\log\left(cx^n\right)-bn\right)}{fm^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(a + b*Log[c*x^n]),x]
```

```
[Out] ((f*x)^m*(a*m - b*n + b*m*Log[c*x^n]))/(f*m^2)
```

fricas [A] time = 0.42, size = 42, normalized size = 1.11

$$\frac{\left(bmnx\log(x)+bmx\log(c)+(am-bn)x\right)e^{\left((m-1)\log(f)+(m-1)\log(x)\right)}}{m^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] (b*m*n*x*log(x) + b*m*x*log(c) + (a*m - b*n)*x)*e^((m - 1)*log(f) + (m - 1)
*log(x))/m^2
```

giac [B] time = 0.32, size = 80, normalized size = 2.11

$$\frac{b\frac{1}{f}^m x^m|f|^{2m}\log(c)}{fm}+\frac{bf^m nx^m\log(x)}{fm}+\frac{a\frac{1}{f}^m x^m|f|^{2m}}{fm}-\frac{bf^m nx^m}{fm^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*(1/f)^m*x^m*abs(f)^(2*m)*log(c)/(f*m) + b*f^m*n*x^m*log(x)/(f*m) + a*(1/f
)^m*x^m*abs(f)^(2*m)/(f*m) - b*f^m*n*x^m/(f*m^2)
```

maple [C] time = 0.16, size = 281, normalized size = 7.39

$$\frac{bx\, e^{\frac{(m-1)\left(-i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ix)\mathrm{csgn}(ifx)+i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ifx)^2+i\pi\,\mathrm{csgn}(ix)\mathrm{csgn}(ifx)^2-i\pi\mathrm{csgn}(ifx)^3+2\ln(f)+2\ln(x)\right)}{2}}\ln(x^n)}{m}+\frac{\left(-i\pi bm\,\mathrm{csgn}(ic)\,\mathrm{csgn}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(b*ln(c*x^n)+a),x)
```

```
[Out] b/m*x*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*c
sgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x
)))*ln(x^n)+1/2*(I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2*m-I*Pi*b*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*m-I*Pi*b*csgn(I*c*x^n)^3*m+I*Pi*b*csgn(I*c*x^n)^2*csg
n(I*c)*m+2*b*m*ln(c)+2*a*m-2*b*n)/m^2*x*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn
(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2
-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x)))
```

maxima [A] time = 0.72, size = 48, normalized size = 1.26

$$-\frac{bf^{m-1}nx^m}{m^2}+\frac{(fx)^m\, b\log(cx^n)}{fm}+\frac{(fx)^m\, a}{fm}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -b*f^(m - 1)*n*x^m/m^2 + (f*x)^m*b*log(c*x^n)/(f*m) + (f*x)^m*a/(f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int (f\,x)^{m-1}\,(a+b\,\ln(c\,x^n))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m - 1)*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^(m - 1)*(a + b*log(c*x^n)), x)
```

sympy [A] time = 22.25, size = 148, normalized size = 3.89

$$\begin{cases} \tilde{\infty}\left(ax+bnx\log(x)-bnx+bx\log(c)\right) & \text{for } f=0 \wedge m=0 \\ \frac{\begin{cases} a\log(x) & \text{for } b=0 \\ -\left(-a-b\log(c)\right)\log(x) & \text{for } n=0 \\ \frac{\left(-a-b\log(cx^n)\right)^2}{2bn} & \text{otherwise} \end{cases}}{f} & \text{for } m=0 \\ 0^{m-1}\left(ax+bnx\log(x)-bnx+bx\log(c)\right) & \text{for } f=0 \\ \frac{af^mx^m}{fm}+\frac{bf^mnx^m\log(x)}{fm}+\frac{bf^mx^m\log(c)}{fm}-\frac{bf^mnx^m}{fm^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((zoo*(a*x + b*n*x*log(x) - b*n*x + b*x*log(c)), Eq(f, 0) & Eq(m,
0)), (Piecewise((a*log(x), Eq(b, 0)), (-(-a - b*log(c))*log(x), Eq(n, 0)),
((-a - b*log(c*x**n))**2/(2*b*n), True))/f, Eq(m, 0)), (0**(m - 1)*(a*x + b
*n*x*log(x) - b*n*x + b*x*log(c)), Eq(f, 0)), (a*f**m*x**m/(f*m) + b*f**m*n
*x**m*log(x)/(f*m) + b*f**m*x**m*log(c)/(f*m) - b*f**m*n*x**m/(f*m**2), Tru
e))
```

3.355 $\int \frac{(fx)^{-1+m}(a+b\log(cx^n))}{d+ex^m}\,dx$

Optimal. Leaf size=77

$$\frac{x^{1-m}(fx)^{m-1}\log\left(\frac{ex^m}{d}+1\right)(a+b\log(cx^n))}{em}+\frac{bnx^{1-m}(fx)^{m-1}\text{Li}_2\left(-\frac{ex^m}{d}\right)}{em^2}$$

```
[Out] x^(1-m)*(f*x)^(-1+m)*(a+b*ln(c*x^n))*ln(1+e*x^m/d)/e/m+b*n*x^(1-m)*(f*x)^(-
1+m)*polylog(2,-e*x^m/d)/e/m^2
```

Rubi [A] time = 0.19, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2339, 2337, 2391}

$$\frac{bnx^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{ex^m}{d}\right)}{em^2}+\frac{x^{1-m}(fx)^{m-1}\log\left(\frac{ex^m}{d}+1\right)(a+b\log(cx^n))}{em}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m),x]
```

```
[Out] (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*Log[1 + (e*x^m)/d])/(e*m) + (b
*n*x^(1 - m)*(f*x)^(-1 + m)*PolyLog[2, -((e*x^m)/d)])/(e*m^2)
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{(fx)^{-1+m}(a+b\log(cx^n))}{d+ex^m}\,dx &= \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}(a+b\log(cx^n))}{d+ex^m}\,dx\\ &= \frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))\log\left(1+\frac{ex^m}{d}\right)}{em}-\frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{\log\left(1+\right.}{x}}{em}\\ &= \frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))\log\left(1+\frac{ex^m}{d}\right)}{em}+\frac{bnx^{1-m}(fx)^{-1+m}\text{Li}_2\left(-\frac{ex^m}{d}\right)}{em^2}\end{aligned}$$

Mathematica [A] time = 0.15, size = 141, normalized size = 1.83

$$\frac{x^{-m}(fx)^m\left(m\log(x)\left(am+bm\log\left(cx^n\right)+bn\log\left(d+ex^m\right)-bn\log\left(d-dx^m\right)\right)+am\log\left(d-dx^m\right)+bm\log\left(cx^n\right.\right.}{efm^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m),x]
```

```
[Out] ((f*x)^m*(-(b*m^2*n*Log[x]^2) + a*m*Log[d - d*x^m] + b*m*Log[c*x^n]*Log[d -
 d*x^m] - b*n*Log[-((e*x^m)/d)]*Log[d + e*x^m] + m*Log[x]*(a*m + b*m*Log[c*
x^n] - b*n*Log[d - d*x^m] + b*n*Log[d + e*x^m]) - b*n*PolyLog[2, 1 + (e*x^m
)/d]))/(e*f*m^2*x^m)
```

fricas [A] time = 0.44, size = 77, normalized size = 1.00

$$\frac{bf^{m-1}mn\log(x)\log\left(\frac{ex^m+d}{d}\right)+bf^{m-1}n\mathrm{Li}_2\left(-\frac{ex^m+d}{d}+1\right)+\left(bm\log(c)+am\right)f^{m-1}\log\left(ex^m+d\right)}{em^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m),x, algorithm="fricas")
```

```
[Out] (b*f^(m - 1)*m*n*log(x)*log((e*x^m + d)/d) + b*f^(m - 1)*n*dilog(-(e*x^m +
d)/d + 1) + (b*m*log(c) + a*m)*f^(m - 1)*log(e*x^m + d))/(e*m^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)\left(fx\right)^{m-1}}{ex^m+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^(m - 1)/(e*x^m + d), x)
```

maple [F] time = 1.06, size = 0, normalized size = 0.00

$$\int\frac{\left(b\ln\left(c\,x^n\right)+a\right)\left(fx\right)^{m-1}}{e\,x^m+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(b*ln(c*x^n)+a)/(d+e*x^m),x)
```

```
[Out] int((f*x)^(m-1)*(b*ln(c*x^n)+a)/(d+e*x^m),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b\int\frac{f^mx^m\log(c)+f^mx^m\log\left(x^n\right)}{efxx^m+dfx}\,dx+\frac{af^{m-1}\log\left(\frac{ex^m+d}{e}\right)}{em}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m),x, algorithm="maxima")
```

```
[Out] b*integrate((f^m*x^m*log(c) + f^m*x^m*log(x^n))/(e*f*x*x^m + d*f*x), x) + a
*f^(m - 1)*log((e*x^m + d)/e)/(e*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(f\,x\right)^{m-1}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{d+e\,x^m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^(m - 1)*(a + b*log(c*x^n)))/(d + e*x^m),x)
[Out] int(((f*x)^(m - 1)*(a + b*log(c*x^n)))/(d + e*x^m), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(fx\right)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{d+ex^m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))/(d+e*x**m),x)
[Out] Integral((f*x)**(m - 1)*(a + b*log(c*x**n))/(d + e*x**m), x)
```

3.356 $\int \frac{(fx)^{-1+m}(a+b\log(cx^n))}{(d+ex^m)^2}\,dx$

Optimal. Leaf size=69

$$\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{dfm\left(d+ex^m\right)}-\frac{bnx^{-m}(fx)^m\log\left(d+ex^m\right)}{defm^2}$$

```
[Out] (f*x)^m*(a+b*ln(c*x^n))/d/f/m/(d+e*x^m)-b*n*(f*x)^m*ln(d+e*x^m)/d/e/f/m^2/(
x^m)
```

Rubi [A] time = 0.11, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2335, 268, 260}

$$\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{dfm\left(d+ex^m\right)}-\frac{bnx^{-m}(fx)^m\log\left(d+ex^m\right)}{defm^2}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^2,x]
```

```
[Out] ((f*x)^m*(a + b*Log[c*x^n]))/(d*f*m*(d + e*x^m)) - (b*n*(f*x)^m*Log[d + e*x
^m])/(d*e*f*m^2*x^m)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 268

```
Int[((c_)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(c^In
tPart[m]*(c*x)^FracPart[m])/x^FracPart[m], Int[x^m*(a + b*x^n)^p, x], x] /;
 FreeQ[{a, b, c, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^m\right)^2}\,dx &= \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{dfm\left(d+ex^m\right)}-\frac{(bn)\int \frac{(fx)^{-1+m}}{d+ex^m}\,dx}{dm}\\
&= \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{dfm\left(d+ex^m\right)}-\frac{\left(bnx^{-m}(fx)^m\right)\int \frac{x^{-1+m}}{d+ex^m}\,dx}{dfm}\\
&= \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{dfm\left(d+ex^m\right)}-\frac{bnx^{-m}(fx)^m\log\left(d+ex^m\right)}{defm^2}
\end{aligned}$$

Mathematica [A] time = 0.12, size = 89, normalized size = 1.29

$$-\frac{x^{-m}(fx)^m \left(adm + bdm\log\left(cx^n\right) + benx^m\log\left(d+ex^m\right) - bmn\log(x)\left(d+ex^m\right) + bdn\log\left(d+ex^m\right)\right)}{defm^2\left(d+ex^m\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^2,x]
```

```
[Out] -(((f*x)^m*(a*d*m - b*m*n*(d + e*x^m)*Log[x] + b*d*m*Log[c*x^n] + b*d*n*Log
[d + e*x^m] + b*e*n*x^m*Log[d + e*x^m]))/(d*e*f*m^2*x^m*(d + e*x^m)))
```

fricas [A] time = 0.41, size = 89, normalized size = 1.29

$$\frac{bef^{m-1}mnx^m\log(x) - \left(bdm\log(c) + adm\right)f^{m-1} - \left(bef^{m-1}nx^m + bdf^{m-1}n\right)\log\left(ex^m+d\right)}{de^2m^2x^m + d^2em^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^2,x, algorithm="fricas")
```

```
[Out] (b*e*f^(m - 1)*m*n*x^m*log(x) - (b*d*m*log(c) + a*d*m)*f^(m - 1) - (b*e*f^(
m - 1)*n*x^m + b*d*f^(m - 1)*n)*log(e*x^m + d))/(d*e^2*m^2*x^m + d^2*e*m^2)
```

giac [B] time = 0.45, size = 206, normalized size = 2.99

$$\frac{bf^m mnxx^m e\log(x)}{dfm^2xx^me^2 + d^2fm^2xe} - \frac{bf^m nxx^m e\log\left(x^me+d\right)}{dfm^2xx^me^2 + d^2fm^2xe} - \frac{bdf^m nx\log\left(x^me+d\right)}{dfm^2xx^me^2 + d^2fm^2xe} - \frac{bdf^m mx\log(c)}{dfm^2xx^me^2 + d^2fm^2xe} - \frac{}{dfm^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^2,x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x*x^m*e*log(x)/(d*f*m^2*x*x^m*e^2 + d^2*f*m^2*x*e) - b*f^m*n*x*x^
m*e*log(x^m*e + d)/(d*f*m^2*x*x^m*e^2 + d^2*f*m^2*x*e) - b*d*f^m*n*x*log(x^
m*e + d)/(d*f*m^2*x*x^m*e^2 + d^2*f*m^2*x*e) - b*d*f^m*m*x*log(c)/(d*f*m^2*
x*x^m*e^2 + d^2*f*m^2*x*e) - a*d*f^m*m*x/(d*f*m^2*x*x^m*e^2 + d^2*f*m^2*x*e
)
```

maple [F] time = 1.27, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^n\right)+a\right)\left(fx\right)^{m-1}}{\left(e\,x^m+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(b*ln(c*x^n)+a)/(e*x^m+d)^2,x)
```

```
[Out] int((f*x)^(m-1)*(b*ln(c*x^n)+a)/(e*x^m+d)^2,x)
```

maxima [A] time = 0.72, size = 97, normalized size = 1.41

$$bf^m n\left(\frac{\log(x)}{defm} - \frac{\log\left(ex^m+d\right)}{defm^2}\right) - \frac{bf^m\log\left(cx^n\right)}{e^2fmx^m + defm} - \frac{af^m}{e^2fmx^m + defm}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^2,x, algorithm="maxima")
```

```
[Out] b*f^m*n*(log(x)/(d*e*f*m) - log(e*x^m + d)/(d*e*f*m^2)) - b*f^m*log(c*x^n)/
(e^2*f*m*x^m + d*e*f*m) - a*f^m/(e^2*f*m*x^m + d*e*f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(f\,x\right)^{m-1}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\left(d+e\,x^m\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^(m - 1)*(a + b*log(c*x^n)))/(d + e*x^m)^2,x)
[Out] int(((f*x)^(m - 1)*(a + b*log(c*x^n)))/(d + e*x^m)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))/(d+e*x**m)**2,x)
[Out] Timed out
```

3.357 $\int \frac{(fx)^{-1+m}(a+b\log(cx^n))}{(d+ex^m)^3}\,dx$

Optimal. Leaf size=150

$$-\frac{x^{1-m}(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{2em\left(d+ex^m\right)^2}-\frac{bnx^{1-m}(fx)^{m-1}\log\left(d+ex^m\right)}{2d^2em^2}+\frac{bnx^{1-m}\log(x)(fx)^{m-1}}{2d^2em}+\frac{bnx^{1-m}(fx)^{m-1}}{2dem^2\left(d+ex^m\right)}$$

```
[Out] 1/2*b*n*x^(1-m)*(f*x)^(-1+m)/d/e/m^2/(d+e*x^m)+1/2*b*n*x^(1-m)*(f*x)^(-1+m)
*ln(x)/d^2/e/m-1/2*x^(1-m)*(f*x)^(-1+m)*(a+b*ln(c*x^n))/e/m/(d+e*x^m)^2-1/2
*b*n*x^(1-m)*(f*x)^(-1+m)*ln(d+e*x^m)/d^2/e/m^2
```

Rubi [A] time = 0.22, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {2339, 2338, 266, 44}

$$-\frac{x^{1-m}(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{2em\left(d+ex^m\right)^2}-\frac{bnx^{1-m}(fx)^{m-1}\log\left(d+ex^m\right)}{2d^2em^2}+\frac{bnx^{1-m}\log(x)(fx)^{m-1}}{2d^2em}+\frac{bnx^{1-m}(fx)^{m-1}}{2dem^2\left(d+ex^m\right)}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^3,x]
```

```
[Out] (b*n*x^(1 - m)*(f*x)^(-1 + m))/(2*d*e*m^2*(d + e*x^m)) + (b*n*x^(1 - m)*(f*
x)^(-1 + m)*Log[x])/(2*d^2*e*m) - (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^
n]))/(2*e*m*(d + e*x^m)^2) - (b*n*x^(1 - m)*(f*x)^(-1 + m)*Log[d + e*x^m])/
(2*d^2*e*m^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rubi steps

$$\int \frac{(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{(d+ex^m)^3}\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{(d+ex^m)^3}\,dx$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{2em\,(d+ex^m)^2} + \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{1}{x(d+ex^m)^2}\,dx}{2em}$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{2em\,(d+ex^m)^2} + \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\text{Subst}\left(\int \frac{1}{x(d+ex)^2}\,dx, x,\right.}{2em^2}$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{2em\,(d+ex^m)^2} + \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\text{Subst}\left(\int \left(\frac{1}{d^2x} - \frac{e}{d(d+ex)^2}\right.\right.}{2em^2}$$

$$= \frac{bnx^{1-m}(fx)^{-1+m}}{2dem^2\,(d+ex^m)} + \frac{bnx^{1-m}(fx)^{-1+m}\log(x)}{2d^2em} - \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{2em\,(d+ex^m)^2}$$

Mathematica [A] time = 0.15, size = 137, normalized size = 0.91

$$\frac{x^{-m}(fx)^m\left(-ad^2m - bd^2m\log\left(cx^n\right) - bd^2n\log\left(d+ex^m\right) + bd^2n - be^2nx^{2m}\log\left(d+ex^m\right) + bdenx^m - 2bdenx^m\log\right.}{2d^2efm^2\,(d+ex^m)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^3,x]
```

```
[Out] ((f*x)^m*(-(a*d^2*m) + b*d^2*n + b*d*e*n*x^m + b*m*n*(d + e*x^m)^2*Log[x] -
 b*d^2*m*Log[c*x^n] - b*d^2*n*Log[d + e*x^m] - 2*b*d*e*n*x^m*Log[d + e*x^m]
 - b*e^2*n*x^(2*m)*Log[d + e*x^m]))/(2*d^2*e*f*m^2*x^m*(d + e*x^m)^2)
```

fricas [A] time = 0.41, size = 167, normalized size = 1.11

$$\frac{be^2f^{m-1}mnx^{2m}\log(x) + \left(2\,bdemn\log(x) + bden\right)f^{m-1}x^m - \left(bd^2m\log(c) + ad^2m - bd^2n\right)f^{m-1} - \left(be^2f^{m-1}nx^{2m}\right.}{2\left(d^2e^3m^2x^{2m} + 2\,d^3e^2m^2x^m + d^4em^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(b*e^2*f^(m - 1)*m*n*x^(2*m)*log(x) + (2*b*d*e*m*n*log(x) + b*d*e*n)*f^
(m - 1)*x^m - (b*d^2*m*log(c) + a*d^2*m - b*d^2*n)*f^(m - 1) - (b*e^2*f^(m
- 1)*n*x^(2*m) + 2*b*d*e*f^(m - 1)*n*x^m + b*d^2*f^(m - 1)*n)*log(e*x^m + d
))/(d^2*e^3*m^2*x^(2*m) + 2*d^3*e^2*m^2*x^m + d^4*e*m^2)
```

giac [B] time = 0.48, size = 628, normalized size = 4.19

$$\frac{bdf^mmnx^2x^me\log(x)}{2\,d^3fm^2x^2x^me^2 + d^4fm^2x^2e + d^2fm^2x^2x^{2m}e^3} - \frac{bdf^mnx^2x^me\log\left(x^me+d\right)}{2\,d^3fm^2x^2x^me^2 + d^4fm^2x^2e + d^2fm^2x^2x^{2m}e^3} + \frac{bf^m}{2\left(2\,d^3fm^2x^2x^me^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^3,x, algorithm="giac")
```

```
[Out] b*d*f^m*m*n*x^2*x^m*e*log(x)/(2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d
^2*f*m^2*x^2*x^(2*m)*e^3) - b*d*f^m*n*x^2*x^m*e*log(x^m*e + d)/(2*d^3*f*m^2
*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d^2*f*m^2*x^2*x^(2*m)*e^3) + 1/2*b*f^m*m*n
*x^2*x^(2*m)*e^2*log(x)/(2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d^2*f*
m^2*x^2*x^(2*m)*e^3) + 1/2*b*d*f^m*n*x^2*x^m*e/(2*d^3*f*m^2*x^2*x^m*e^2 + d
```

```
^4*f*m^2*x^2*e + d^2*f*m^2*x^2*x^(2*m)*e^3) - 1/2*b*d^2*f^m*n*x^2*log(x^m*e
 + d)/(2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d^2*f*m^2*x^2*x^(2*m)*e^
3) - 1/2*b*f^m*n*x^2*x^(2*m)*e^2*log(x^m*e + d)/(2*d^3*f*m^2*x^2*x^m*e^2 +
d^4*f*m^2*x^2*e + d^2*f*m^2*x^2*x^(2*m)*e^3) - 1/2*b*d^2*f^m*m*x^2*log(c)/(
2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d^2*f*m^2*x^2*x^(2*m)*e^3) - 1/
2*a*d^2*f^m*m*x^2/(2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d^2*f*m^2*x^
2*x^(2*m)*e^3) + 1/2*b*d^2*f^m*n*x^2/(2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x
^2*e + d^2*f*m^2*x^2*x^(2*m)*e^3)
```

maple [F] time = 1.24, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^{n})+a)\left(f x\right)^{m-1}}{(e\,x^{m}+d)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(b*ln(c*x^n)+a)/(e*x^m+d)^3,x)
```

```
[Out] int((f*x)^(m-1)*(b*ln(c*x^n)+a)/(e*x^m+d)^3,x)
```

maxima [A] time = 0.77, size = 152, normalized size = 1.01

$$\frac{1}{2}\,bf^{m}n\left(\frac{1}{\left(de^{2}fmx^{m}+d^{2}efm\right)m}+\frac{\log(x)}{d^{2}efm}-\frac{\log\left(ex^{m}+d\right)}{d^{2}efm^{2}}\right)-\frac{bf^{m}\log\left(cx^{n}\right)}{2\left(e^{3}fmx^{2\,m}+2\,de^{2}fmx^{m}+d^{2}efm\right)}-\frac{}{2\left(e^{3}fmx^{2}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^3,x, algorithm="maxima")
```

```
[Out] 1/2*b*f^m*n*(1/((d*e^2*f*m*x^m + d^2*e*f*m)*m) + log(x)/(d^2*e*f*m) - log(e
*x^m + d)/(d^2*e*f*m^2)) - 1/2*b*f^m*log(c*x^n)/(e^3*f*m*x^(2*m) + 2*d*e^2*
f*m*x^m + d^2*e*f*m) - 1/2*a*f^m/(e^3*f*m*x^(2*m) + 2*d*e^2*f*m*x^m + d^2*e
*f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(f\,x\right)^{m-1}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{\left(d+e\,x^{m}\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^(m - 1)*(a + b*log(c*x^n)))/(d + e*x^m)^3,x)
```

```
[Out] int(((f*x)^(m - 1)*(a + b*log(c*x^n)))/(d + e*x^m)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))/(d+e*x**m)**3,x)
```

```
[Out] Timed out
```

3.358 $\int \frac{(fx)^{-1+m}\left(a+b\log(cx^n)\right)}{(d+ex^m)^4}\,dx$

Optimal. Leaf size=188

$$-\frac{x^{1-m}(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{3em\left(d+ex^m\right)^3}-\frac{bnx^{1-m}(fx)^{m-1}\log\left(d+ex^m\right)}{3d^3em^2}+\frac{bnx^{1-m}\log(x)(fx)^{m-1}}{3d^3em}+\frac{bnx^{1-m}(fx)^{m-1}}{3d^2em^2\left(d+ex^m\right)}+\frac{bnx}{6dem}$$

```
[Out] 1/6*b*n*x^(1-m)*(f*x)^(-1+m)/d/e/m^2/(d+e*x^m)^2+1/3*b*n*x^(1-m)*(f*x)^(-1+
m)/d^2/e/m^2/(d+e*x^m)+1/3*b*n*x^(1-m)*(f*x)^(-1+m)*ln(x)/d^3/e/m-1/3*x^(1-
m)*(f*x)^(-1+m)*(a+b*ln(c*x^n))/e/m/(d+e*x^m)^3-1/3*b*n*x^(1-m)*(f*x)^(-1+m
)*ln(d+e*x^m)/d^3/e/m^2
```

Rubi [A] time = 0.23, antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {2339, 2338, 266, 44}

$$-\frac{x^{1-m}(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{3em\left(d+ex^m\right)^3}+\frac{bnx^{1-m}(fx)^{m-1}}{3d^2em^2\left(d+ex^m\right)}-\frac{bnx^{1-m}(fx)^{m-1}\log\left(d+ex^m\right)}{3d^3em^2}+\frac{bnx^{1-m}\log(x)(fx)^{m-1}}{3d^3em}+\frac{bnx}{6dem}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^4,x]
```

```
[Out] (b*n*x^(1 - m)*(f*x)^(-1 + m))/(6*d*e*m^2*(d + e*x^m)^2) + (b*n*x^(1 - m)*(
f*x)^(-1 + m))/(3*d^2*e*m^2*(d + e*x^m)) + (b*n*x^(1 - m)*(f*x)^(-1 + m)*Lo
g[x])/(3*d^3*e*m) - (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(3*e*m*(d
 + e*x^m)^3) - (b*n*x^(1 - m)*(f*x)^(-1 + m)*Log[d + e*x^m])/(3*d^3*e*m^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rubi steps

$$\int \frac{(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{(d+ex^m)^4}\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{(d+ex^m)^4}\,dx$$
$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{3em\,(d+ex^m)^3} + \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{1}{x(d+ex^m)^3}\,dx}{3em}$$
$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{3em\,(d+ex^m)^3} + \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\mathrm{Subst}\left(\int \frac{1}{x(d+ex)^3}\,dx\right.}{3em^2}$$
$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{3em\,(d+ex^m)^3} + \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\mathrm{Subst}\left(\int\left(\frac{1}{d^3x} - \frac{}{d(d+}\right.\right.}{3em}$$
$$= \frac{bnx^{1-m}(fx)^{-1+m}}{6dem^2\,(d+ex^m)^2} + \frac{bnx^{1-m}(fx)^{-1+m}}{3d^2em^2\,(d+ex^m)} + \frac{bnx^{1-m}(fx)^{-1+m}\log(x)}{3d^3em} - \frac{x^{1-m}(f}{}$$

Mathematica [A] time = 0.16, size = 178, normalized size = 0.95

$$\frac{x^{-m}(fx)^m\left(-2ad^3m - 2bd^3m\log\left(cx^n\right) - 2bd^3n\log\left(d+ex^m\right) + 3bd^3n + 5bd^2enx^m - 6bd^2enx^m\log\left(d+ex^m\right) - \right.}{6d^3efm^2\,(d+ex^m)}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^4,x]
```

```
[Out] ((f*x)^m*(-2*a*d^3*m + 3*b*d^3*n + 5*b*d^2*e*n*x^m + 2*b*d*e^2*n*x^(2*m) +
2*b*m*n*(d + e*x^m)^3*Log[x] - 2*b*d^3*m*Log[c*x^n] - 2*b*d^3*n*Log[d + e*x
^m] - 6*b*d^2*e*n*x^m*Log[d + e*x^m] - 6*b*d*e^2*n*x^(2*m)*Log[d + e*x^m] -
 2*b*e^3*n*x^(3*m)*Log[d + e*x^m]))/(6*d^3*e*f*m^2*x^m*(d + e*x^m)^3)
```

fricas [A] time = 0.42, size = 242, normalized size = 1.29

$$\frac{2\,be^3f^{m-1}mnx^{3\,m}\log(x) + 2\left(3\,bde^2mn\log(x) + bde^2n\right)f^{m-1}x^{2\,m} + \left(6\,bd^2emn\log(x) + 5\,bd^2en\right)f^{m-1}x^m - \left(2\,b\right.}{6\left(d^3e^4m^2x^{3\,m} + 3\,d^4e^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^4,x, algorithm="fricas")
```

```
[Out] 1/6*(2*b*e^3*f^(m - 1)*m*n*x^(3*m)*log(x) + 2*(3*b*d*e^2*m*n*log(x) + b*d*e
^2*n)*f^(m - 1)*x^(2*m) + (6*b*d^2*e*m*n*log(x) + 5*b*d^2*e*n)*f^(m - 1)*x^
m - (2*b*d^3*m*log(c) + 2*a*d^3*m - 3*b*d^3*n)*f^(m - 1) - 2*(b*e^3*f^(m -
1)*n*x^(3*m) + 3*b*d*e^2*f^(m - 1)*n*x^(2*m) + 3*b*d^2*e*f^(m - 1)*n*x^m +
b*d^3*f^(m - 1)*n)*log(e*x^m + d))/(d^3*e^4*m^2*x^(3*m) + 3*d^4*e^3*m^2*x^(
2*m) + 3*d^5*e^2*m^2*x^m + d^6*e*m^2)
```

giac [B] time = 0.64, size = 1080, normalized size = 5.74

$$\frac{bd^2f^mmnx^3x^me\log(x)}{3\,d^5fm^2x^3x^me^2 + d^6fm^2x^3e + 3\,d^4fm^2x^3x^{2\,m}e^3 + d^3fm^2x^3x^{3\,m}e^4} - \frac{bd^2f^mnx^3x^me\log\left(x^me\right.}{3\,d^5fm^2x^3x^me^2 + d^6fm^2x^3e + 3\,d^4fm^2x^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^4,x, algorithm="giac")
```

```
[Out] b*d^2*f^m*m*n*x^3*x^m*e*log(x)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e +
 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) - b*d^2*f^m*n*x^3
```

```
*x^m*e*log(x^m*e + d)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*
m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) + b*d*f^m*m*n*x^3*x^(2*m)*
e^2*log(x)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(
2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) + 5/6*b*d^2*f^m*n*x^3*x^m*e/(3*d^5*f*
m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2
*x^3*x^(3*m)*e^4) - 1/3*b*d^3*f^m*n*x^3*log(x^m*e + d)/(3*d^5*f*m^2*x^3*x^m
*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m
)*e^4) - b*d*f^m*n*x^3*x^(2*m)*e^2*log(x^m*e + d)/(3*d^5*f*m^2*x^3*x^m*e^2
+ d^6*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4
) - 1/3*b*d^3*f^m*m*x^3*log(c)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e +
 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) + 1/3*b*f^m*m*n*x
^3*x^(3*m)*e^3*log(x)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*
m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) - 1/3*a*d^3*f^m*m*x^3/(3*d
^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*
f*m^2*x^3*x^(3*m)*e^4) + 1/2*b*d^3*f^m*n*x^3/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6
*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) + 1
/3*b*d*f^m*n*x^3*x^(2*m)*e^2/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3
*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) - 1/3*b*f^m*n*x^3*x
^(3*m)*e^3*log(x^m*e + d)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^
4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4)
```

maple [F] time = 1.09, size = 0, normalized size = 0.00

$$\int \frac{\left(b \ln \left(c\,x^{n}\right)+a\right) \left(f x\right)^{m -1}}{\left(e\,x^{m}+d\right)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(b*ln(c*x^n)+a)/(e*x^m+d)^4,x)
```

```
[Out] int((f*x)^(m-1)*(b*ln(c*x^n)+a)/(e*x^m+d)^4,x)
```

maxima [A] time = 0.81, size = 210, normalized size = 1.12

$$\frac{1}{6}\,bf^{m}n\left(\frac{2\,ex^{m}+3\,d}{\left(d^{2}e^{3}fmx^{2\,m}+2\,d^{3}e^{2}fmx^{m}+d^{4}efm\right)m}+\frac{2\,\log(x)}{d^{3}efm}-\frac{2\,\log\left(ex^{m}+d\right)}{d^{3}efm^{2}}\right)-\frac{bf^{m}\log\left(cx\right.}{3\left(e^{4}fmx^{3\,m}+3\,de^{3}fmx^{2\,m}+3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^4,x, algorithm="maxima")
```

```
[Out] 1/6*b*f^m*n*((2*e*x^m + 3*d)/((d^2*e^3*f*m*x^(2*m) + 2*d^3*e^2*f*m*x^m + d^
4*e*f*m)*m) + 2*log(x)/(d^3*e*f*m) - 2*log(e*x^m + d)/(d^3*e*f*m^2)) - 1/3*
b*f^m*log(c*x^n)/(e^4*f*m*x^(3*m) + 3*d*e^3*f*m*x^(2*m) + 3*d^2*e^2*f*m*x^m
 + d^3*e*f*m) - 1/3*a*f^m/(e^4*f*m*x^(3*m) + 3*d*e^3*f*m*x^(2*m) + 3*d^2*e^
2*f*m*x^m + d^3*e*f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(f\,x\right)}^{m-1}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{{\left(d+e\,x^m\right)}^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^(m - 1)*(a + b*log(c*x^n)))/(d + e*x^m)^4,x)
```

```
[Out] int(((f*x)^(m - 1)*(a + b*log(c*x^n)))/(d + e*x^m)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))/(d+e*x**m)**4,x)
```

```
[Out] Timed out
```

3.359 $\int (fx)^{-1+m} (d+ex^m)^3 \left(a+b\log(cx^n)\right)^2 \, dx$

Optimal. Leaf size=372

$$-\frac{bd^4nx^{1-m}\log(x)(fx)^{m-1}\left(a+b\log(cx^n)\right)}{2em}-\frac{2bd^3nx(fx)^{m-1}\left(a+b\log(cx^n)\right)}{m^2}-\frac{3bd^2enx^{m+1}(fx)^{m-1}\left(a+b\log(cx\right.}{2m^2}$$

```
[Out] 2*b^2*d^3*n^2*x*(f*x)^(-1+m)/m^3+3/4*b^2*d^2*e*n^2*x^(1+m)*(f*x)^(-1+m)/m^3
+2/9*b^2*d*e^2*n^2*x^(1+2*m)*(f*x)^(-1+m)/m^3+1/32*b^2*e^3*n^2*x^(1+3*m)*(f
*x)^(-1+m)/m^3+1/4*b^2*d^4*n^2*x^(1-m)*(f*x)^(-1+m)*ln(x)^2/e/m-2*b*d^3*n*x
*(f*x)^(-1+m)*(a+b*ln(c*x^n))/m^2-3/2*b*d^2*e*n*x^(1+m)*(f*x)^(-1+m)*(a+b*l
n(c*x^n))/m^2-2/3*b*d*e^2*n*x^(1+2*m)*(f*x)^(-1+m)*(a+b*ln(c*x^n))/m^2-1/8*
b*e^3*n*x^(1+3*m)*(f*x)^(-1+m)*(a+b*ln(c*x^n))/m^2-1/2*b*d^4*n*x^(1-m)*(f*x
)^(-1+m)*ln(x)*(a+b*ln(c*x^n))/e/m+1/4*x^(1-m)*(f*x)^(-1+m)*(d+e*x^m)^4*(a+
b*ln(c*x^n))^2/e/m
```

Rubi [A] time = 0.48, antiderivative size = 294, normalized size of antiderivative = 0.79, number of steps used = 7, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.241$, Rules used = {2339, 2338, 266, 43, 2334, 14, 2301}

$$-\frac{bnx^{1-m}(fx)^{m-1}\left(\frac{36d^2e^2x^{2m}}{m}+\frac{48d^3ex^m}{m}+12d^4\log(x)+\frac{16de^3x^{3m}}{m}+\frac{3e^4x^{4m}}{m}\right)\left(a+b\log(cx^n)\right)}{24em}+\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^4}{4em}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)^3*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b^2*d^3*n^2*x*(f*x)^(-1 + m))/m^3 + (3*b^2*d^2*e*n^2*x^(1 + m)*(f*x)^(-1
 + m))/(4*m^3) + (2*b^2*d*e^2*n^2*x^(1 + 2*m)*(f*x)^(-1 + m))/(9*m^3) + (b^
2*e^3*n^2*x^(1 + 3*m)*(f*x)^(-1 + m))/(32*m^3) + (b^2*d^4*n^2*x^(1 - m)*(f*
x)^(-1 + m)*Log[x]^2)/(4*e*m) - (b*n*x^(1 - m)*(f*x)^(-1 + m)*((48*d^3*e*x^
m)/m + (36*d^2*e^2*x^(2*m))/m + (16*d*e^3*x^(3*m))/m + (3*e^4*x^(4*m))/m +
12*d^4*Log[x])*(a + b*Log[c*x^n]))/(24*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d
+ e*x^m)^4*(a + b*Log[c*x^n])^2)/(4*e*m)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rubi steps

$$\int (fx)^{-1+m}(d+ex^m)^3\left(a+b\log(cx^n)\right)^2\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int x^{-1+m}(d+ex^m)^3\left(a+b\log(cx^n)\right)^2\,dx$$

$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^4\left(a+b\log(cx^n)\right)^2}{4em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right.}{}$$

$$= -\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{48d^3ex^m}{m}+\frac{36d^2e^2x^{2m}}{m}+\frac{16de^3x^{3m}}{m}+\frac{3e^4x^{4m}}{m}+12d\right.}{24em}$$

$$= -\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{48d^3ex^m}{m}+\frac{36d^2e^2x^{2m}}{m}+\frac{16de^3x^{3m}}{m}+\frac{3e^4x^{4m}}{m}+12d\right.}{24em}$$

$$= \frac{b^2d^4n^2x^{1-m}(fx)^{-1+m}\log^2(x)}{4em} - \frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{48d^3ex^m}{m}+\frac{36d^2}{}\right.}{}$$

$$= \frac{2b^2d^3n^2x(fx)^{-1+m}}{m^3} + \frac{3b^2d^2en^2x^{1+m}(fx)^{-1+m}}{4m^3} + \frac{2b^2de^2n^2x^{1+2m}}{9m^3}$$

Mathematica [A] time = 0.26, size = 285, normalized size = 0.77

$$\frac{(fx)^m\left(72a^2m^2\left(4d^3+6d^2ex^m+4de^2x^{2m}+e^3x^{3m}\right)+12bm\log(cx^n)\left(12am\left(4d^3+6d^2ex^m+4de^2x^{2m}+e^3x^{3m}\right)\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)^3*(a + b*Log[c*x^n])^2,x]
```

```
[Out] ((f*x)^m*(72*a^2*m^2*(4*d^3 + 6*d^2*e*x^m + 4*d*e^2*x^(2*m) + e^3*x^(3*m))
- 12*a*b*m*n*(48*d^3 + 36*d^2*e*x^m + 16*d*e^2*x^(2*m) + 3*e^3*x^(3*m)) + b
^2*n^2*(576*d^3 + 216*d^2*e*x^m + 64*d*e^2*x^(2*m) + 9*e^3*x^(3*m)) + 12*b*
m*(12*a*m*(4*d^3 + 6*d^2*e*x^m + 4*d*e^2*x^(2*m) + e^3*x^(3*m)) - b*n*(48*d
^3 + 36*d^2*e*x^m + 16*d*e^2*x^(2*m) + 3*e^3*x^(3*m)))*Log[c*x^n] + 72*b^2*
```

```
m^2*(4*d^3 + 6*d^2*e*x^m + 4*d*e^2*x^(2*m) + e^3*x^(3*m))*Log[c*x^n]^2))/(2
88*f*m^3)
```

fricas [A] time = 0.45, size = 592, normalized size = 1.59

$$\frac{9\left(8\,b^2e^3m^2n^2\log(x)^2+8\,b^2e^3m^2\log(c)^2+8\,a^2e^3m^2-4\,abe^3mn+b^2e^3n^2+4\left(4\,abe^3m^2-b^2e^3mn\right)\log(c)+4\left(4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n))^2,x, algorithm="fricas"
)
```

```
[Out] 1/288*(9*(8*b^2*e^3*m^2*n^2*log(x)^2 + 8*b^2*e^3*m^2*log(c)^2 + 8*a^2*e^3*m
^2 - 4*a*b*e^3*m*n + b^2*e^3*n^2 + 4*(4*a*b*e^3*m^2 - b^2*e^3*m*n)*log(c) +
 4*(4*b^2*e^3*m^2*n*log(c) + 4*a*b*e^3*m^2*n - b^2*e^3*m*n^2)*log(x))*f^(m
- 1)*x^(4*m) + 32*(9*b^2*d*e^2*m^2*n^2*log(x)^2 + 9*b^2*d*e^2*m^2*log(c)^2
+ 9*a^2*d*e^2*m^2 - 6*a*b*d*e^2*m*n + 2*b^2*d*e^2*n^2 + 6*(3*a*b*d*e^2*m^2
- b^2*d*e^2*m*n)*log(c) + 6*(3*b^2*d*e^2*m^2*n*log(c) + 3*a*b*d*e^2*m^2*n -
 b^2*d*e^2*m*n^2)*log(x))*f^(m - 1)*x^(3*m) + 216*(2*b^2*d^2*e*m^2*n^2*log(
x)^2 + 2*b^2*d^2*e*m^2*log(c)^2 + 2*a^2*d^2*e*m^2 - 2*a*b*d^2*e*m*n + b^2*d
^2*e*n^2 + 2*(2*a*b*d^2*e*m^2 - b^2*d^2*e*m*n)*log(c) + 2*(2*b^2*d^2*e*m^2*
n*log(c) + 2*a*b*d^2*e*m^2*n - b^2*d^2*e*m*n^2)*log(x))*f^(m - 1)*x^(2*m) +
 288*(b^2*d^3*m^2*n^2*log(x)^2 + b^2*d^3*m^2*log(c)^2 + a^2*d^3*m^2 - 2*a*b
*d^3*m*n + 2*b^2*d^3*n^2 + 2*(a*b*d^3*m^2 - b^2*d^3*m*n)*log(c) + 2*(b^2*d^
3*m^2*n*log(c) + a*b*d^3*m^2*n - b^2*d^3*m*n^2)*log(x))*f^(m - 1)*x^m)/m^3
```

giac [B] time = 1.57, size = 1009, normalized size = 2.71

$$\frac{b^2d^3f^mn^2x^m\log(x)^2}{fm}+\frac{3\,b^2d^2f^mn^2x^{2\,m}e\log(x)^2}{2\,fm}+\frac{b^2d^3\frac{1}{f}^m x^m|f|^{2\,m}\log(c)^2}{fm}+\frac{2\,b^2d^3f^mnx^m\log(c)\log(x)}{fm}+\frac{3\,b^2d^2f^m}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] b^2*d^3*f^m*n^2*x^m*log(x)^2/(f*m) + 3/2*b^2*d^2*f^m*n^2*x^(2*m)*e*log(x)^2
/(f*m) + b^2*d^3*(1/f)^m*x^m*abs(f)^(2*m)*log(c)^2/(f*m) + 2*b^2*d^3*f^m*n*
x^m*log(c)*log(x)/(f*m) + 3*b^2*d^2*f^m*n*x^(2*m)*e*log(c)*log(x)/(f*m) + b
^2*d*f^m*n^2*x^(3*m)*e^2*log(x)^2/(f*m) + 2*a*b*d^3*(1/f)^m*x^m*abs(f)^(2*m
)*log(c)/(f*m) + 3/2*b^2*d^2*f^m*x^(2*m)*e*log(c)^2/(f*m) + 2*a*b*d^3*f^m*n
*x^m*log(x)/(f*m) - 2*b^2*d^3*f^m*n^2*x^m*log(x)/(f*m^2) + 3*a*b*d^2*f^m*n*
x^(2*m)*e*log(x)/(f*m) - 3/2*b^2*d^2*f^m*n^2*x^(2*m)*e*log(x)/(f*m^2) + 2*b
^2*d*f^m*n*x^(3*m)*e^2*log(c)*log(x)/(f*m) + 1/4*b^2*f^m*n^2*x^(4*m)*e^3*lo
g(x)^2/(f*m) + a^2*d^3*(1/f)^m*x^m*abs(f)^(2*m)/(f*m) - 2*b^2*d^3*f^m*n*x^m
*log(c)/(f*m^2) + 3*a*b*d^2*f^m*x^(2*m)*e*log(c)/(f*m) - 3/2*b^2*d^2*f^m*n*
x^(2*m)*e*log(c)/(f*m^2) + b^2*d*f^m*x^(3*m)*e^2*log(c)^2/(f*m) + 2*a*b*d*f
^m*n*x^(3*m)*e^2*log(x)/(f*m) - 2/3*b^2*d*f^m*n^2*x^(3*m)*e^2*log(x)/(f*m^2
) + 1/2*b^2*f^m*n*x^(4*m)*e^3*log(c)*log(x)/(f*m) - 2*a*b*d^3*f^m*n*x^m/(f*
m^2) + 2*b^2*d^3*f^m*n^2*x^m/(f*m^3) + 3/2*a^2*d^2*f^m*x^(2*m)*e/(f*m) - 3/
2*a*b*d^2*f^m*n*x^(2*m)*e/(f*m^2) + 3/4*b^2*d^2*f^m*n^2*x^(2*m)*e/(f*m^3) +
 2*a*b*d*f^m*x^(3*m)*e^2*log(c)/(f*m) - 2/3*b^2*d*f^m*n*x^(3*m)*e^2*log(c)/
(f*m^2) + 1/4*b^2*f^m*x^(4*m)*e^3*log(c)^2/(f*m) + 1/2*a*b*f^m*n*x^(4*m)*e^
3*log(x)/(f*m) - 1/8*b^2*f^m*n^2*x^(4*m)*e^3*log(x)/(f*m^2) + a^2*d*f^m*x^(
3*m)*e^2/(f*m) - 2/3*a*b*d*f^m*n*x^(3*m)*e^2/(f*m^2) + 2/9*b^2*d*f^m*n^2*x^
(3*m)*e^2/(f*m^3) + 1/2*a*b*f^m*x^(4*m)*e^3*log(c)/(f*m) - 1/8*b^2*f^m*n*x^
(4*m)*e^3*log(c)/(f*m^2) + 1/4*a^2*f^m*x^(4*m)*e^3/(f*m) - 1/8*a*b*f^m*n*x^
(4*m)*e^3/(f*m^2) + 1/32*b^2*f^m*n^2*x^(4*m)*e^3/(f*m^3)
```

maple [C] time = 0.71, size = 4156, normalized size = 11.17

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(e*x^m+d)^3*(b*ln(c*x^n)+a)^2,x)
```

```
[Out] 1/4*b^2*(e^3*(x^m)^3+4*d*e^2*(x^m)^2+6*d^2*e*x^m+4*d^3)*x/m*exp(1/2*(m-1)*(
-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csg
n(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x)))*ln(x^n)^2+1/24*b*
(-48*b*d^3*n+48*a*d^3*m-3*b*e^3*n*(x^m)^3+12*a*e^3*(x^m)^3*m-24*I*Pi*b*d^3*
m*csgn(I*c*x^n)^3+6*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^3*m+6*I*Pi
*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^3*m-24*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*
(x^m)^2*m+72*b*d^2*e*m*x^m*ln(c)+48*ln(c)*b*d*e^2*(x^m)^2*m-36*I*Pi*b*d^2*e
*m*x^m*csgn(I*c*x^n)^3-24*I*Pi*b*d^3*m*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+
48*b*d^3*m*ln(c)-6*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^3*m
+24*I*Pi*b*d^3*m*csgn(I*x^n)*csgn(I*c*x^n)^2+24*I*Pi*b*d^3*m*csgn(I*c)*csgn
(I*c*x^n)^2+36*I*Pi*b*d^2*e*m*x^m*csgn(I*x^n)*csgn(I*c*x^n)^2+36*I*Pi*b*d^2
*e*m*x^m*csgn(I*c)*csgn(I*c*x^n)^2+48*a*d*e^2*(x^m)^2*m-24*I*Pi*b*d*e^2*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2*m-36*I*Pi*b*d^2*e*m*x^m*csgn(I*c)*
csgn(I*x^n)*csgn(I*c*x^n)+72*a*d^2*e*m*x^m-16*b*d*e^2*n*(x^m)^2-36*b*d^2*e*
n*x^m+12*ln(c)*b*e^3*(x^m)^3*m+24*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*
(x^m)^2*m+24*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^2*m-6*I*Pi*b*e^3*
csgn(I*c*x^n)^3*(x^m)^3*m)*x/m^2*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*c
sgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*c
sgn(I*f*x)^3+2*ln(f)+2*ln(x)))*ln(x^n)+1/288*(576*b^2*d^3*n^2-18*Pi^2*b^2*e
^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4*(x^m)^3*m^2-108*Pi^2*b^2*d^2*e*csgn(I*c*x^
n)^6*x^m*m^2+144*Pi^2*b^2*d^3*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*m^2-7
2*Pi^2*b^2*d^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*m^2-288*Pi^2*b^2*d
^3*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*m^2+288*a^2*d^3*m^2+18*I*Pi*b^2*e^
3*m*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^3+432*I*Pi*ln(c)*b^2*d^2*e*
csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m^2+432*I*Pi*ln(c)*b^2*d^2*e*csgn(I*c*x^n)^
2*csgn(I*c)*x^m*m^2+288*I*Pi*a*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^2*
m^2-288*I*Pi*a*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*m^2+144*Pi^2*b^2*d
^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*m^2+36*Pi^2*b^2*e^3*csgn(I*x^n)*
csgn(I*c*x^n)^5*(x^m)^3*m^2+36*Pi^2*b^2*e^3*csgn(I*c*x^n)^5*csgn(I*c)*(x^m)
^3*m^2-18*Pi^2*b^2*e^3*csgn(I*c*x^n)^4*csgn(I*c)^2*(x^m)^3*m^2-72*Pi^2*b^2*
d*e^2*csgn(I*c*x^n)^6*(x^m)^2*m^2+432*a^2*d^2*e*x^m*m^2+72*ln(c)^2*b^2*e^3*
(x^m)^3*m^2+64*b^2*d*e^2*n^2*(x^m)^2+216*b^2*d^2*e*n^2*x^m+288*a^2*d*e^2*(x
^m)^2*m^2-72*I*Pi*a*b*e^3*csgn(I*c*x^n)^3*(x^m)^3*m^2+18*I*Pi*b^2*e^3*m*n*c
sgn(I*c*x^n)^3*(x^m)^3+144*Pi^2*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^5*(x^m)
^2*m^2+144*Pi^2*b^2*d*e^2*csgn(I*c*x^n)^5*csgn(I*c)*(x^m)^2*m^2-72*Pi^2*b^2
*d*e^2*csgn(I*c*x^n)^4*csgn(I*c)^2*(x^m)^2*m^2+9*b^2*e^3*n^2*(x^m)^3+72*a^2
*e^3*(x^m)^3*m^2+288*ln(c)^2*b^2*d^3*m^2+288*I*Pi*ln(c)*b^2*d^3*csgn(I*x^n)
*csgn(I*c*x^n)^2*m^2+288*I*Pi*ln(c)*b^2*d^3*csgn(I*c*x^n)^2*csgn(I*c)*m^2-1
08*Pi^2*b^2*d^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^4*x^m*m^2+216*Pi^2*b^2*d^2*e*
csgn(I*x^n)*csgn(I*c*x^n)^5*x^m*m^2+216*Pi^2*b^2*d^2*e*csgn(I*c*x^n)^5*csgn
(I*c)*x^m*m^2-108*Pi^2*b^2*d^2*e*csgn(I*c*x^n)^4*csgn(I*c)^2*x^m*m^2+144*Pi
^2*b^2*d*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*(x^m)^2*m^2-72*Pi^2*b^
2*d*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*(x^m)^2*m^2-288*Pi^2*b^2*
d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*(x^m)^2*m^2+144*Pi^2*b^2*d*e^2*
csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*(x^m)^2*m^2+216*Pi^2*b^2*d^2*e*csgn
(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x^m*m^2+216*Pi^2*b^2*d^2*e*csgn(I*x^n)*
csgn(I*c*x^n)^3*csgn(I*c)^2*x^m*m^2+72*I*Pi*ln(c)*b^2*e^3*csgn(I*x^n)*csgn(
I*c*x^n)^2*(x^m)^3*m^2+576*ln(c)*a*b*d^3*m^2-576*ln(c)*b^2*d^3*m*n+432*ln(c
)^2*b^2*d^2*e*x^m*m^2-36*a*b*e^3*m*n*(x^m)^3+96*I*Pi*b^2*d*e^2*m*n*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2-432*I*Pi*a*b*d^2*e*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)*x^m*m^2+216*I*Pi*b^2*d^2*e*m*n*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*x^m-288*I*Pi*ln(c)*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x
^m)^2*m^2-432*I*Pi*ln(c)*b^2*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*
m^2-288*I*Pi*a*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2*m^2-72*I
*Pi*ln(c)*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^3*m^2+288*I*Pi*
ln(c)*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^2*m^2+288*I*Pi*ln(c)*b^2*
```

```
d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^2*m^2-576*a*b*d^3*m*n+144*Pi^2*b^2*d^
3*csgn(I*x^n)*csgn(I*c*x^n)^5*m^2+144*Pi^2*b^2*d^3*csgn(I*c*x^n)^5*csgn(I*c
)*m^2-72*Pi^2*b^2*d^3*csgn(I*c*x^n)^4*csgn(I*c)^2*m^2-18*Pi^2*b^2*e^3*csgn(
I*c*x^n)^6*(x^m)^3*m^2-36*ln(c)*b^2*e^3*m*n*(x^m)^3+288*ln(c)^2*b^2*d*e^2*(
x^m)^2*m^2+144*ln(c)*a*b*e^3*(x^m)^3*m^2+864*ln(c)*a*b*d^2*e*x^m*m^2-192*ln
(c)*b^2*d*e^2*m*n*(x^m)^2-432*ln(c)*b^2*d^2*e*m*n*x^m+576*ln(c)*a*b*d*e^2*(
x^m)^2*m^2-192*a*b*d*e^2*m*n*(x^m)^2-432*a*b*d^2*e*m*n*x^m+72*I*Pi*ln(c)*b^
2*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^3*m^2-288*I*Pi*ln(c)*b^2*d*e^2*csgn(I
*c*x^n)^3*(x^m)^2*m^2+72*I*Pi*a*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^3*m
^2+72*I*Pi*a*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^3*m^2+96*I*Pi*b^2*d*e^2*
m*n*csgn(I*c*x^n)^3*(x^m)^2-432*I*Pi*a*b*d^2*e*csgn(I*c*x^n)^3*x^m*m^2+216*
I*Pi*b^2*d^2*e*m*n*csgn(I*c*x^n)^3*x^m-18*I*Pi*b^2*e^3*m*n*csgn(I*x^n)*csgn
(I*c*x^n)^2*(x^m)^3-18*I*Pi*b^2*e^3*m*n*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^3-4
32*I*Pi*ln(c)*b^2*d^2*e*csgn(I*c*x^n)^3*x^m*m^2-288*I*Pi*a*b*d*e^2*csgn(I*c
*x^n)^3*(x^m)^2*m^2+288*I*Pi*a*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2*m^2+288*I*
Pi*a*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)*m^2-288*I*Pi*b^2*d^3*m*n*csgn(I*x^n)*c
sgn(I*c*x^n)^2-288*I*Pi*b^2*d^3*m*n*csgn(I*c*x^n)^2*csgn(I*c)+288*I*Pi*a*b*
d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^2*m^2-96*I*Pi*b^2*d*e^2*m*n*csgn(I*x^
n)*csgn(I*c*x^n)^2*(x^m)^2-96*I*Pi*b^2*d*e^2*m*n*csgn(I*c*x^n)^2*csgn(I*c)*
(x^m)^2+432*I*Pi*a*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m^2+432*I*Pi*a*b
*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m^2-216*I*Pi*b^2*d^2*e*m*n*csgn(I*x^n)
*csgn(I*c*x^n)^2*x^m-216*I*Pi*b^2*d^2*e*m*n*csgn(I*c*x^n)^2*csgn(I*c)*x^m-7
2*Pi^2*b^2*d^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4*m^2-72*I*Pi*a*b*e^3*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^3*m^2+36*Pi^2*b^2*e^3*csgn(I*x^n)^2*csgn(I*
c*x^n)^3*csgn(I*c)*(x^m)^3*m^2-18*Pi^2*b^2*e^3*csgn(I*x^n)^2*csgn(I*c*x^n)^
2*csgn(I*c)^2*(x^m)^3*m^2-72*Pi^2*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(
I*c)*(x^m)^3*m^2+36*Pi^2*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*(x
^m)^3*m^2-72*Pi^2*b^2*d*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4*(x^m)^2*m^2-72*I*
Pi*ln(c)*b^2*e^3*csgn(I*c*x^n)^3*(x^m)^3*m^2-288*I*Pi*ln(c)*b^2*d^3*csgn(I*
c*x^n)^3*m^2-288*I*Pi*a*b*d^3*csgn(I*c*x^n)^3*m^2+288*I*Pi*b^2*d^3*m*n*csgn
(I*c*x^n)^3-72*Pi^2*b^2*d^3*csgn(I*c*x^n)^6*m^2-108*Pi^2*b^2*d^2*e*csgn(I*x
^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x^m*m^2-432*Pi^2*b^2*d^2*e*csgn(I*x^n)*cs
gn(I*c*x^n)^4*csgn(I*c)*x^m*m^2+288*I*Pi*b^2*d^3*m*n*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)-288*I*Pi*ln(c)*b^2*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*m^
2)*x/m^3*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f
)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*l
n(x)))
```

maxima [A] time = 1.18, size = 578, normalized size = 1.55

$$\frac{b^2e^3f^{m-1}x^{4m}\log(cx^n)^2}{4m}+\frac{b^2de^2f^{m-1}x^{3m}\log(cx^n)^2}{m}+\frac{3b^2d^2ef^{m-1}x^{2m}\log(cx^n)^2}{2m}+\frac{abe^3f^{m-1}x^{4m}\log(cx^n)}{2m}+\frac{2abde^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n))^2,x, algorithm="maxima"
)
```

```
[Out] 1/4*b^2*e^3*f^(m - 1)*x^(4*m)*log(c*x^n)^2/m + b^2*d*e^2*f^(m - 1)*x^(3*m)*
log(c*x^n)^2/m + 3/2*b^2*d^2*e*f^(m - 1)*x^(2*m)*log(c*x^n)^2/m + 1/2*a*b*e
^3*f^(m - 1)*x^(4*m)*log(c*x^n)/m + 2*a*b*d*e^2*f^(m - 1)*x^(3*m)*log(c*x^n
)/m + 3*a*b*d^2*e*f^(m - 1)*x^(2*m)*log(c*x^n)/m - 2*(f^(m - 1)*n*x^m*log(c
*x^n)/m^2 - f^(m - 1)*n^2*x^m/m^3)*b^2*d^3 - 3/4*(2*f^(m - 1)*n*x^(2*m)*log
(c*x^n)/m^2 - f^(m - 1)*n^2*x^(2*m)/m^3)*b^2*d^2*e - 2/9*(3*f^(m - 1)*n*x^(
3*m)*log(c*x^n)/m^2 - f^(m - 1)*n^2*x^(3*m)/m^3)*b^2*d*e^2 - 1/32*(4*f^(m -
 1)*n*x^(4*m)*log(c*x^n)/m^2 - f^(m - 1)*n^2*x^(4*m)/m^3)*b^2*e^3 + 1/4*a^2
*e^3*f^(m - 1)*x^(4*m)/m - 1/8*a*b*e^3*f^(m - 1)*n*x^(4*m)/m^2 + a^2*d*e^2*
f^(m - 1)*x^(3*m)/m - 2/3*a*b*d*e^2*f^(m - 1)*n*x^(3*m)/m^2 + 3/2*a^2*d^2*e
*f^(m - 1)*x^(2*m)/m - 3/2*a*b*d^2*e*f^(m - 1)*n*x^(2*m)/m^2 - 2*a*b*d^3*f^
(m - 1)*n*x^m/m^2 + (f*x)^m*b^2*d^3*log(c*x^n)^2/(f*m) + 2*(f*x)^m*a*b*d^3*
log(c*x^n)/(f*m) + (f*x)^m*a^2*d^3/(f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(f\,x\right)}^{m-1}\,{\left(d+e\,x^m\right)}^3\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m - 1)*(d + e*x^m)^3*(a + b*log(c*x^n))^2,x)
[Out] int((f*x)^(m - 1)*(d + e*x^m)^3*(a + b*log(c*x^n))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)**3*(a+b*ln(c*x**n))**2,x)
[Out] Timed out
```

3.360 $\int (fx)^{-1+m}(d+ex^m)^2\left(a+b\log\left(cx^n\right)\right)^2\,dx$

Optimal. Leaf size=298

$$-\frac{2bd^3nx^{1-m}\log(x)(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{3em}-\frac{2bd^2nx(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{m^2}-\frac{bdenx^{m+1}(fx)^{m-1}\left(a+b\log\left(cx^n\right.\right.}{m^2}$$

```
[Out] 2*b^2*d^2*n^2*x*(f*x)^(-1+m)/m^3+1/2*b^2*d*e*n^2*x^(1+m)*(f*x)^(-1+m)/m^3+2
/27*b^2*e^2*n^2*x^(1+2*m)*(f*x)^(-1+m)/m^3+1/3*b^2*d^3*n^2*x^(1-m)*(f*x)^(-
1+m)*ln(x)^2/e/m-2*b*d^2*n*x*(f*x)^(-1+m)*(a+b*ln(c*x^n))/m^2-b*d*e*n*x^(1+
m)*(f*x)^(-1+m)*(a+b*ln(c*x^n))/m^2-2/9*b*e^2*n*x^(1+2*m)*(f*x)^(-1+m)*(a+b
*ln(c*x^n))/m^2-2/3*b*d^3*n*x^(1-m)*(f*x)^(-1+m)*ln(x)*(a+b*ln(c*x^n))/e/m+
1/3*x^(1-m)*(f*x)^(-1+m)*(d+e*x^m)^3*(a+b*ln(c*x^n))^2/e/m
```

Rubi [A] time = 0.44, antiderivative size = 245, normalized size of antiderivative = 0.82, number of steps used = 7, number of rules used = 8, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.276, Rules used = {2339, 2338, 266, 43, 2334, 12, 14, 2301}

$$-\frac{bnx^{1-m}(fx)^{m-1}\left(\frac{18d^2ex^m}{m}+6d^3\log(x)+\frac{9de^2x^{2m}}{m}+\frac{2e^3x^{3m}}{m}\right)\left(a+b\log\left(cx^n\right)\right)}{9em}+\frac{x^{1-m}(fx)^{m-1}\left(d+ex^m\right)^3\left(a+b\log\left(c\right.\right.}{3em}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)^2*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b^2*d^2*n^2*x*(f*x)^(-1 + m))/m^3 + (b^2*d*e*n^2*x^(1 + m)*(f*x)^(-1 + m
))/(2*m^3) + (2*b^2*e^2*n^2*x^(1 + 2*m)*(f*x)^(-1 + m))/(27*m^3) + (b^2*d^3
*n^2*x^(1 - m)*(f*x)^(-1 + m)*Log[x]^2)/(3*e*m) - (b*n*x^(1 - m)*(f*x)^(-1
+ m)*((18*d^2*e*x^m)/m + (9*d*e^2*x^(2*m))/m + (2*e^3*x^(3*m))/m + 6*d^3*Lo
g[x])*(a + b*Log[c*x^n]))/(9*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^3
*(a + b*Log[c*x^n])^2)/(3*e*m)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rubi steps

$$\int (fx)^{-1+m}(d+ex^m)^2\left(a+b\log(cx^n)\right)^2\,dx=\left(x^{1-m}(fx)^{-1+m}\right)\int x^{-1+m}(d+ex^m)^2\left(a+b\log(cx^n)\right)^2\,dx$$

$$=\frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^3\left(a+b\log(cx^n)\right)^2}{3em}-\frac{\left(2bnx^{1-m}(fx)^{-1+\right.}{}$$

$$=-\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{18d^2ex^m}{m}+\frac{9de^2x^{2m}}{m}+\frac{2e^3x^{3m}}{m}+6d^3\log(x)\right)\left(a+\right.}{9em}$$

$$=-\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{18d^2ex^m}{m}+\frac{9de^2x^{2m}}{m}+\frac{2e^3x^{3m}}{m}+6d^3\log(x)\right)\left(a+\right.}{9em}$$

$$=-\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{18d^2ex^m}{m}+\frac{9de^2x^{2m}}{m}+\frac{2e^3x^{3m}}{m}+6d^3\log(x)\right)\left(a+\right.}{9em}$$

$$=\frac{2b^2d^2n^2x(fx)^{-1+m}}{m^3}+\frac{b^2den^2x^{1+m}(fx)^{-1+m}}{2m^3}+\frac{2b^2e^2n^2x^{1+2m}(fx}{27m^3}$$

$$=\frac{2b^2d^2n^2x(fx)^{-1+m}}{m^3}+\frac{b^2den^2x^{1+m}(fx)^{-1+m}}{2m^3}+\frac{2b^2e^2n^2x^{1+2m}(fx}{27m^3}$$

Mathematica [A] time = 0.20, size = 207, normalized size = 0.69

$$\frac{(fx)^m\left(18a^2m^2\left(3d^2+3dex^m+e^2x^{2m}\right)+6bm\log(cx^n)\left(6am\left(3d^2+3dex^m+e^2x^{2m}\right)-bn\left(18d^2+9dex^m+2e^2\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)^2*(a + b*Log[c*x^n])^2,x]
```

```
[Out] ((f*x)^m*(18*a^2*m^2*(3*d^2 + 3*d*e*x^m + e^2*x^(2*m)) - 6*a*b*m*n*(18*d^2
+ 9*d*e*x^m + 2*e^2*x^(2*m)) + b^2*n^2*(108*d^2 + 27*d*e*x^m + 4*e^2*x^(2*m
)) + 6*b*m*(6*a*m*(3*d^2 + 3*d*e*x^m + e^2*x^(2*m)) - b*n*(18*d^2 + 9*d*e*x
^m + 2*e^2*x^(2*m)))*Log[c*x^n] + 18*b^2*m^2*(3*d^2 + 3*d*e*x^m + e^2*x^(2*
m))*Log[c*x^n]^2))/(54*f*m^3)
```

fricas [A] time = 0.43, size = 419, normalized size = 1.41

$$\frac{2\left(9\,b^2e^2m^2n^2\log(x)^2+9\,b^2e^2m^2\log(c)^2+9\,a^2e^2m^2-6\,abe^2mn+2\,b^2e^2n^2+6\left(3\,abe^2m^2-b^2e^2mn\right)\log(c)+6\left(\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n))^2,x, algorithm="fricas"
)
```

```
[Out] 1/54*(2*(9*b^2*e^2*m^2*n^2*log(x)^2 + 9*b^2*e^2*m^2*log(c)^2 + 9*a^2*e^2*m^
2 - 6*a*b*e^2*m*n + 2*b^2*e^2*n^2 + 6*(3*a*b*e^2*m^2 - b^2*e^2*m*n)*log(c)
+ 6*(3*b^2*e^2*m^2*n*log(c) + 3*a*b*e^2*m^2*n - b^2*e^2*m*n^2)*log(x))*f^(m
 - 1)*x^(3*m) + 27*(2*b^2*d*e*m^2*n^2*log(x)^2 + 2*b^2*d*e*m^2*log(c)^2 + 2
*a^2*d*e*m^2 - 2*a*b*d*e*m*n + b^2*d*e*n^2 + 2*(2*a*b*d*e*m^2 - b^2*d*e*m*n
)*log(c) + 2*(2*b^2*d*e*m^2*n*log(c) + 2*a*b*d*e*m^2*n - b^2*d*e*m*n^2)*log
(x))*f^(m - 1)*x^(2*m) + 54*(b^2*d^2*m^2*n^2*log(x)^2 + b^2*d^2*m^2*log(c)^
2 + a^2*d^2*m^2 - 2*a*b*d^2*m*n + 2*b^2*d^2*n^2 + 2*(a*b*d^2*m^2 - b^2*d^2*
m*n)*log(c) + 2*(b^2*d^2*m^2*n*log(c) + a*b*d^2*m^2*n - b^2*d^2*m*n^2)*log(
x))*f^(m - 1)*x^m)/m^3
```

giac [B] time = 0.96, size = 739, normalized size = 2.48

$$\frac{b^2d^2f^mn^2x^m\log(x)^2}{fm}+\frac{b^2df^mn^2x^{2\,m}e\log(x)^2}{fm}+\frac{b^2d^2\left(\frac{1}{f}\right)^mx^m|f|^{2\,m}\log(c)^2}{fm}+\frac{2\,b^2d^2f^mnx^m\log(c)\log(x)}{fm}+\frac{2\,b^2df^mnx^{2\,m}\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] b^2*d^2*f^m*n^2*x^m*log(x)^2/(f*m) + b^2*d*f^m*n^2*x^(2*m)*e*log(x)^2/(f*m)
 + b^2*d^2*(1/f)^m*x^m*abs(f)^(2*m)*log(c)^2/(f*m) + 2*b^2*d^2*f^m*n*x^m*lo
g(c)*log(x)/(f*m) + 2*b^2*d*f^m*n*x^(2*m)*e*log(c)*log(x)/(f*m) + 1/3*b^2*f
^m*n^2*x^(3*m)*e^2*log(x)^2/(f*m) + 2*a*b*d^2*(1/f)^m*x^m*abs(f)^(2*m)*log(
c)/(f*m) + b^2*d*f^m*x^(2*m)*e*log(c)^2/(f*m) + 2*a*b*d^2*f^m*n*x^m*log(x)/
(f*m) - 2*b^2*d^2*f^m*n^2*x^m*log(x)/(f*m^2) + 2*a*b*d*f^m*n*x^(2*m)*e*log(
x)/(f*m) - b^2*d*f^m*n^2*x^(2*m)*e*log(x)/(f*m^2) + 2/3*b^2*f^m*n*x^(3*m)*e
^2*log(c)*log(x)/(f*m) + a^2*d^2*(1/f)^m*x^m*abs(f)^(2*m)/(f*m) - 2*b^2*d^2
*f^m*n*x^m*log(c)/(f*m^2) + 2*a*b*d*f^m*x^(2*m)*e*log(c)/(f*m) - b^2*d*f^m*
n*x^(2*m)*e*log(c)/(f*m^2) + 1/3*b^2*f^m*x^(3*m)*e^2*log(c)^2/(f*m) + 2/3*a
*b*f^m*n*x^(3*m)*e^2*log(x)/(f*m) - 2/9*b^2*f^m*n^2*x^(3*m)*e^2*log(x)/(f*m
^2) - 2*a*b*d^2*f^m*n*x^m/(f*m^2) + 2*b^2*d^2*f^m*n^2*x^m/(f*m^3) + a^2*d*f
^m*x^(2*m)*e/(f*m) - a*b*d*f^m*n*x^(2*m)*e/(f*m^2) + 1/2*b^2*d*f^m*n^2*x^(2
*m)*e/(f*m^3) + 2/3*a*b*f^m*x^(3*m)*e^2*log(c)/(f*m) - 2/9*b^2*f^m*n*x^(3*m
)*e^2*log(c)/(f*m^2) + 1/3*a^2*f^m*x^(3*m)*e^2/(f*m) - 2/9*a*b*f^m*n*x^(3*m
)*e^2/(f*m^2) + 2/27*b^2*f^m*n^2*x^(3*m)*e^2/(f*m^3)
```

maple [C] time = 0.51, size = 3038, normalized size = 10.19

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(e*x^m+d)^2*(b*ln(c*x^n)+a)^2,x)
```

```
[Out] 1/3*b^2*(e^2*(x^m)^2+3*d*e*x^m+3*d^2)*x/m*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*cs
gn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)
^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x)))*ln(x^n)^2+1/9*b*(9*I*Pi*b*d*e*m*x^m
*csgn(I*x^n)*csgn(I*c*x^n)^2+9*I*Pi*b*d^2*m*csgn(I*x^n)*csgn(I*c*x^n)^2+9*I
*Pi*b*d^2*m*csgn(I*c)*csgn(I*c*x^n)^2-9*I*Pi*b*d*e*m*x^m*csgn(I*c)*csgn(I*x
^n)*csgn(I*c*x^n)+9*I*Pi*b*d*e*m*x^m*csgn(I*c)*csgn(I*c*x^n)^2-3*I*Pi*b*e^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2*m+3*I*Pi*b*e^2*csgn(I*c*x^n)^2
*csgn(I*c)*(x^m)^2*m-9*I*Pi*b*d*e*m*x^m*csgn(I*c*x^n)^3+3*I*Pi*b*e^2*csgn(I
*x^n)*csgn(I*c*x^n)^2*(x^m)^2*m-9*I*Pi*b*d^2*m*csgn(I*c*x^n)^3-9*I*Pi*b*d^2
*m*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-3*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^m)^2
*m+6*ln(c)*b*e^2*(x^m)^2*m+18*b*d*e*m*x^m*ln(c)+6*a*e^2*(x^m)^2*m-2*b*e^2*n
*(x^m)^2+18*b*d^2*m*ln(c)+18*a*d*e*m*x^m-9*b*d*e*n*x^m+18*a*d^2*m-18*b*d^2*
n)*x/m^2*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f
)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*l
n(x)))*ln(x^n)+1/108*(8*b^2*e^2*n^2*(x^m)^2+36*a^2*e^2*(x^m)^2*m^2+108*a^2*
d^2*m^2+216*b^2*d^2*n^2+54*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(
I*c)*m^2-108*I*Pi*ln(c)*b^2*d^2*csgn(I*c*x^n)^3*m^2+54*I*Pi*b^2*d*e*m*n*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m-108*I*Pi*ln(c)*b^2*d*e*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*x^m*m^2-108*I*Pi*a*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*x^m*m^2+216*ln(c)*a*b*d^2*m^2-216*ln(c)*b^2*d^2*m*n+36*ln(c)^2*b^2*e
^2*(x^m)^2*m^2+108*a^2*d*e*x^m*m^2+54*b^2*d*e*n^2*x^m+108*ln(c)^2*b^2*d^2*m
^2+12*I*Pi*b^2*e^2*m*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2+108*I*Pi
*a*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m^2+108*I*Pi*a*b*d*e*csgn(I*c*x^n)
^2*csgn(I*c)*x^m*m^2+54*Pi^2*b^2*d^2*csgn(I*c*x^n)^5*csgn(I*c)*m^2-27*Pi^2*
b^2*d^2*csgn(I*c*x^n)^4*csgn(I*c)^2*m^2-9*Pi^2*b^2*e^2*csgn(I*c*x^n)^6*(x^m
)^2*m^2+54*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*m^2-9*Pi^2*
b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4*(x^m)^2*m^2+216*ln(c)*a*b*d*e*x^m*m^2
-108*ln(c)*b^2*d*e*m*n*x^m-108*a*b*d*e*m*n*x^m-27*Pi^2*b^2*d^2*csgn(I*x^n)^
2*csgn(I*c*x^n)^2*csgn(I*c)^2*m^2-108*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n
)^4*csgn(I*c)*m^2-27*Pi^2*b^2*d^2*csgn(I*c*x^n)^6*m^2-24*a*b*e^2*m*n*(x^m)^
2-24*ln(c)*b^2*e^2*m*n*(x^m)^2+108*ln(c)^2*b^2*d*e*x^m*m^2+72*ln(c)*a*b*e^2
*(x^m)^2*m^2-27*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4*m^2+54*Pi^2*b^2*
d^2*csgn(I*x^n)*csgn(I*c*x^n)^5*m^2-54*I*Pi*b^2*d*e*m*n*csgn(I*x^n)*csgn(I*
c*x^n)^2*x^m-54*I*Pi*b^2*d*e*m*n*csgn(I*c*x^n)^2*csgn(I*c)*x^m-36*I*Pi*ln(c
)*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2*m^2+108*I*Pi*ln(c)*b^
2*d^2*csgn(I*c*x^n)^2*csgn(I*c)*m^2+108*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x
^n)^2*m^2-216*a*b*d^2*m*n-108*I*Pi*ln(c)*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*m^2-108*I*Pi*a*b*d*e*csgn(I*c*x^n)^3*x^m*m^2+54*I*Pi*b^2*d*e*m*n*
csgn(I*c*x^n)^3*x^m+108*I*Pi*ln(c)*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*
m^2+108*I*Pi*ln(c)*b^2*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m^2-36*I*Pi*a*b*e^
2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2*m^2+54*Pi^2*b^2*d*e*csgn(I*x^
n)*csgn(I*c*x^n)^5*x^m*m^2-108*I*Pi*a*b*d^2*csgn(I*c*x^n)^3*m^2+108*I*Pi*b^
2*d^2*m*n*csgn(I*c*x^n)^3+18*Pi^2*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)^5*(x^m)
^2*m^2+18*Pi^2*b^2*e^2*csgn(I*c*x^n)^5*csgn(I*c)*(x^m)^2*m^2-9*Pi^2*b^2*e^2
*csgn(I*c*x^n)^4*csgn(I*c)^2*(x^m)^2*m^2-27*Pi^2*b^2*d*e*csgn(I*c*x^n)^6*x^
m*m^2+54*Pi^2*b^2*d*e*csgn(I*c*x^n)^5*csgn(I*c)*x^m*m^2-27*Pi^2*b^2*d*e*csg
n(I*c*x^n)^4*csgn(I*c)^2*x^m*m^2+18*Pi^2*b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n
)^3*csgn(I*c)*(x^m)^2*m^2-9*Pi^2*b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn
(I*c)^2*(x^m)^2*m^2-36*Pi^2*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*(
x^m)^2*m^2+108*I*Pi*ln(c)*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*m^2+36*I*Pi*a
*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^2*m^2+36*I*Pi*a*b*e^2*csgn(I*c*x^n
)^2*csgn(I*c)*(x^m)^2*m^2-12*I*Pi*b^2*e^2*m*n*csgn(I*x^n)*csgn(I*c*x^n)^2*(
x^m)^2-12*I*Pi*b^2*e^2*m*n*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^2+12*I*Pi*b^2*e^
2*m*n*csgn(I*c*x^n)^3*(x^m)^2+18*Pi^2*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)^3*c
sgn(I*c)^2*(x^m)^2*m^2-27*Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^4*x^m*m^
2+108*I*Pi*b^2*d^2*m*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+36*I*Pi*ln(c)*b^
2*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^2*m^2+36*I*Pi*ln(c)*b^2*e^2*csgn(I*
c*x^n)^2*csgn(I*c)*(x^m)^2*m^2-108*I*Pi*ln(c)*b^2*d*e*csgn(I*c*x^n)^3*x^m*m
^2+54*Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x^m*m^2-27*Pi^2*
```

```
b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x^m*m^2-108*Pi^2*b^2*d*e*
csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*x^m*m^2+54*Pi^2*b^2*d*e*csgn(I*x^n)*c
sgn(I*c*x^n)^3*csgn(I*c)^2*x^m*m^2-108*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)*m^2+108*I*Pi*a*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)*m^2-108*I*Pi*b^
2*d^2*m*n*csgn(I*x^n)*csgn(I*c*x^n)^2-108*I*Pi*b^2*d^2*m*n*csgn(I*c*x^n)^2*
csgn(I*c)-36*I*Pi*ln(c)*b^2*e^2*csgn(I*c*x^n)^3*(x^m)^2*m^2-36*I*Pi*a*b*e^2
*csgn(I*c*x^n)^3*(x^m)^2*m^2)*x/m^3*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x
)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*P
i*csgn(I*f*x)^3+2*ln(f)+2*ln(x)))
```

maxima [A] time = 0.73, size = 417, normalized size = 1.40

$$\frac{b^2e^2f^{m-1}x^{3m}\log(cx^n)^2}{3m}+\frac{b^2def^{m-1}x^{2m}\log(cx^n)^2}{m}+\frac{2\,abe^2f^{m-1}x^{3m}\log(cx^n)}{3m}+\frac{2\,abdef^{m-1}x^{2m}\log(cx^n)}{m}-2\left(\frac{f^{m-1}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n))^2,x, algorithm="maxima"
)
```

```
[Out] 1/3*b^2*e^2*f^(m - 1)*x^(3*m)*log(c*x^n)^2/m + b^2*d*e*f^(m - 1)*x^(2*m)*lo
g(c*x^n)^2/m + 2/3*a*b*e^2*f^(m - 1)*x^(3*m)*log(c*x^n)/m + 2*a*b*d*e*f^(m
- 1)*x^(2*m)*log(c*x^n)/m - 2*(f^(m - 1)*n*x^m*log(c*x^n)/m^2 - f^(m - 1)*n
^2*x^m/m^3)*b^2*d^2 - 1/2*(2*f^(m - 1)*n*x^(2*m)*log(c*x^n)/m^2 - f^(m - 1)
*n^2*x^(2*m)/m^3)*b^2*d*e - 2/27*(3*f^(m - 1)*n*x^(3*m)*log(c*x^n)/m^2 - f^
(m - 1)*n^2*x^(3*m)/m^3)*b^2*e^2 + 1/3*a^2*e^2*f^(m - 1)*x^(3*m)/m - 2/9*a*
b*e^2*f^(m - 1)*n*x^(3*m)/m^2 + a^2*d*e*f^(m - 1)*x^(2*m)/m - a*b*d*e*f^(m
- 1)*n*x^(2*m)/m^2 - 2*a*b*d^2*f^(m - 1)*n*x^m/m^2 + (f*x)^m*b^2*d^2*log(c*
x^n)^2/(f*m) + 2*(f*x)^m*a*b*d^2*log(c*x^n)/(f*m) + (f*x)^m*a^2*d^2/(f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(f\,x\right)}^{m-1}\,{\left(d+e\,x^m\right)}^2\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m - 1)*(d + e*x^m)^2*(a + b*log(c*x^n))^2,x)
```

```
[Out] int((f*x)^(m - 1)*(d + e*x^m)^2*(a + b*log(c*x^n))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)**2*(a+b*ln(c*x**n))**2,x)
```

```
[Out] Timed out
```

3.361 $\int (fx)^{-1+m}\left(d+ex^m\right)\left(a+b\log\left(cx^n\right)\right)^2\,dx$

Optimal. Leaf size=226

$$-\frac{bd^2nx^{1-m}\log(x)(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{em}+\frac{x^{1-m}(fx)^{m-1}\left(d+ex^m\right)^2\left(a+b\log\left(cx^n\right)\right)^2}{2em}-\frac{2bdnx(fx)^{m-1}\left(a+b\right.}{m^2}$$

```
[Out] 2*b^2*d*n^2*x*(f*x)^(-1+m)/m^3+1/4*b^2*e*n^2*x^(1+m)*(f*x)^(-1+m)/m^3+1/2*b
^2*d^2*n^2*x^(1-m)*(f*x)^(-1+m)*ln(x)^2/e/m-2*b*d*n*x*(f*x)^(-1+m)*(a+b*ln(
c*x^n))/m^2-1/2*b*e*n*x^(1+m)*(f*x)^(-1+m)*(a+b*ln(c*x^n))/m^2-b*d^2*n*x^(1
-m)*(f*x)^(-1+m)*ln(x)*(a+b*ln(c*x^n))/e/m+1/2*x^(1-m)*(f*x)^(-1+m)*(d+e*x^
m)^2*(a+b*ln(c*x^n))^2/e/m
```

Rubi [A] time = 0.30, antiderivative size = 195, normalized size of antiderivative = 0.86, number of steps used = 7, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {2339, 2338, 266, 43, 2334, 12, 14, 2301}

$$-\frac{bnx^{1-m}(fx)^{m-1}\left(2d^2\log(x)+\frac{4dex^m}{m}+\frac{e^2x^{2m}}{m}\right)\left(a+b\log\left(cx^n\right)\right)}{2em}+\frac{x^{1-m}(fx)^{m-1}\left(d+ex^m\right)^2\left(a+b\log\left(cx^n\right)\right)^2}{2em}+\frac{b^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b^2*d*n^2*x*(f*x)^(-1 + m))/m^3 + (b^2*e*n^2*x^(1 + m)*(f*x)^(-1 + m))/(
4*m^3) + (b^2*d^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*Log[x]^2)/(2*e*m) - (b*n*x^(
1 - m)*(f*x)^(-1 + m)*((4*d*e*x^m)/m + (e^2*x^(2*m))/m + 2*d^2*Log[x])*(a +
 b*Log[c*x^n]))/(2*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^2*(a + b*Lo
g[c*x^n])^2)/(2*e*m)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rubi steps

$$\int (fx)^{-1+m}(d+ex^m)\left(a+b\log(cx^n)\right)^2\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int x^{-1+m}(d+ex^m)\left(a+b\log(cx^n)\right)^2\,dx$$

$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^2\left(a+b\log(cx^n)\right)^2}{2em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int}{e}$$

$$= -\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{4dex^m}{m}+\frac{e^2x^{2m}}{m}+2d^2\log(x)\right)\left(a+b\log(cx^n)\right)}{2em} +$$

$$= -\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{4dex^m}{m}+\frac{e^2x^{2m}}{m}+2d^2\log(x)\right)\left(a+b\log(cx^n)\right)}{2em} +$$

$$= -\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{4dex^m}{m}+\frac{e^2x^{2m}}{m}+2d^2\log(x)\right)\left(a+b\log(cx^n)\right)}{2em} +$$

$$= \frac{2b^2dn^2x(fx)^{-1+m}}{m^3} + \frac{b^2en^2x^{1+m}(fx)^{-1+m}}{4m^3} - \frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{4dex^m}{m}\right.}{}$$

$$= \frac{2b^2dn^2x(fx)^{-1+m}}{m^3} + \frac{b^2en^2x^{1+m}(fx)^{-1+m}}{4m^3} + \frac{b^2d^2n^2x^{1-m}(fx)^{-1+m}\log}{2em}$$

Mathematica [A] time = 0.13, size = 125, normalized size = 0.55

$$\frac{(fx)^m\left(2a^2m^2(2d+ex^m)-2bm\log(cx^n)(bn(4d+ex^m)-2am(2d+ex^m))-2abmn(4d+ex^m)+2b^2m^2\log^2(cx\right.}{4fm^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] ((f*x)^m*(2*a^2*m^2*(2*d + e*x^m) - 2*a*b*m*n*(4*d + e*x^m) + b^2*n^2*(8*d
 + e*x^m) - 2*b*m*(-2*a*m*(2*d + e*x^m) + b*n*(4*d + e*x^m))*Log[c*x^n] + 2*
b^2*m^2*(2*d + e*x^m)*Log[c*x^n]^2))/(4*f*m^3)
```

fricas [A] time = 0.43, size = 244, normalized size = 1.08

$$\frac{\left(2\,b^2em^2n^2\log(x)^2 + 2\,b^2em^2\log(c)^2 + 2\,a^2em^2 - 2\,abemn + b^2en^2 + 2\left(2\,abem^2 - b^2emn\right)\log(c) + 2\left(2\,b^2em^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] 1/4*((2*b^2*e*m^2*n^2*log(x)^2 + 2*b^2*e*m^2*log(c)^2 + 2*a^2*e*m^2 - 2*a*b
*e*m*n + b^2*e*n^2 + 2*(2*a*b*e*m^2 - b^2*e*m*n)*log(c) + 2*(2*b^2*e*m^2*n*
log(c) + 2*a*b*e*m^2*n - b^2*e*m*n^2)*log(x))*f^(m - 1)*x^(2*m) + 4*(b^2*d*
m^2*n^2*log(x)^2 + b^2*d*m^2*log(c)^2 + a^2*d*m^2 - 2*a*b*d*m*n + 2*b^2*d*n
^2 + 2*(a*b*d*m^2 - b^2*d*m*n)*log(c) + 2*(b^2*d*m^2*n*log(c) + a*b*d*m^2*n
 - b^2*d*m*n^2)*log(x))*f^(m - 1)*x^m)/m^3
```

giac [B] time = 0.75, size = 469, normalized size = 2.08

$$\frac{b^2df^mn^2x^m\log(x)^2}{fm}+\frac{b^2f^mn^2x^{2m}e\log(x)^2}{2\,fm}+\frac{b^2d\frac{1}{f}^m x^m\left|f\right|^{2m}\log(c)^2}{fm}+\frac{2\,b^2df^mnx^m\log(c)\log(x)}{fm}+\frac{b^2f^mnx^{2m}e\log}{fm}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] b^2*d*f^m*n^2*x^m*log(x)^2/(f*m) + 1/2*b^2*f^m*n^2*x^(2*m)*e*log(x)^2/(f*m)
 + b^2*d*(1/f)^m*x^m*abs(f)^(2*m)*log(c)^2/(f*m) + 2*b^2*d*f^m*n*x^m*log(c)
*log(x)/(f*m) + b^2*f^m*n*x^(2*m)*e*log(c)*log(x)/(f*m) + 2*a*b*d*(1/f)^m*x
^m*abs(f)^(2*m)*log(c)/(f*m) + 1/2*b^2*f^m*x^(2*m)*e*log(c)^2/(f*m) + 2*a*b
*d*f^m*n*x^m*log(x)/(f*m) - 2*b^2*d*f^m*n^2*x^m*log(x)/(f*m^2) + a*b*f^m*n*
x^(2*m)*e*log(x)/(f*m) - 1/2*b^2*f^m*n^2*x^(2*m)*e*log(x)/(f*m^2) + a^2*d*(
1/f)^m*x^m*abs(f)^(2*m)/(f*m) - 2*b^2*d*f^m*n*x^m*log(c)/(f*m^2) + a*b*f^m*
x^(2*m)*e*log(c)/(f*m) - 1/2*b^2*f^m*n*x^(2*m)*e*log(c)/(f*m^2) - 2*a*b*d*f
^m*n*x^m/(f*m^2) + 2*b^2*d*f^m*n^2*x^m/(f*m^3) + 1/2*a^2*f^m*x^(2*m)*e/(f*m
) - 1/2*a*b*f^m*n*x^(2*m)*e/(f*m^2) + 1/4*b^2*f^m*n^2*x^(2*m)*e/(f*m^3)
```

maple [C] time = 0.38, size = 1920, normalized size = 8.50

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(e*x^m+d)*(b*ln(c*x^n)+a)^2,x)
```

```
[Out] 1/2*b^2*(e*x^m+2*d)*x/m*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x
)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x
)^3+2*ln(f)+2*ln(x)))*ln(x^n)^2+1/2*b*(-I*Pi*b*e*m*x^m*csgn(I*c)*csgn(I*x^n
)*csgn(I*c*x^n)+I*Pi*b*e*m*x^m*csgn(I*c)*csgn(I*c*x^n)^2+I*Pi*b*e*m*x^m*csg
n(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*e*m*x^m*csgn(I*c*x^n)^3-2*I*Pi*b*d*m*csgn(I
*c)*csgn(I*x^n)*csgn(I*c*x^n)+2*I*Pi*b*d*m*csgn(I*c)*csgn(I*c*x^n)^2+2*I*Pi
*b*d*m*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*d*m*csgn(I*c*x^n)^3+2*b*e*m*x^m
*ln(c)+2*a*e*m*x^m+4*b*d*m*ln(c)-b*e*n*x^m+4*a*d*m-4*b*d*n)*x/m^2*exp(1/2*(
m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*
Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x)))*ln(x^n)+1/8
*(8*a^2*d*m^2+4*a^2*e*x^m*m^2+2*b^2*e*n^2*x^m+16*b^2*d*n^2+8*ln(c)^2*b^2*d*
m^2+8*I*Pi*b^2*d*m*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*I*Pi*ln(c)*b^2*e
*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m^2-8*I*Pi*b^2*d*m*n*csgn(I*c*x^n)^2*csgn(I*
c)+2*Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x^m*m^2-Pi^2*b^2*e*
csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x^m*m^2-4*Pi^2*b^2*e*csgn(I*x^n)*
csgn(I*c*x^n)^4*csgn(I*c)*x^m*m^2+2*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^3*
csgn(I*c)^2*x^m*m^2-16*a*b*d*m*n-4*I*Pi*ln(c)*b^2*e*csgn(I*x^n)*csgn(I*c*x^
```

```
n)*csgn(I*c)*x^m*m^2-8*I*Pi*ln(c)*b^2*d*csgn(I*c*x^n)^3*m^2-8*I*Pi*a*b*d*cs
gn(I*c*x^n)^3*m^2+8*I*Pi*b^2*d*m*n*csgn(I*c*x^n)^3+4*I*Pi*a*b*e*csgn(I*x^n)
*csgn(I*c*x^n)^2*x^m*m^2+4*I*Pi*a*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m^2+8*I
*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*m^2+8*I*Pi*a*b*d*csgn(I*c*x^n)^2*csgn
(I*c)*m^2-8*I*Pi*b^2*d*m*n*csgn(I*x^n)*csgn(I*c*x^n)^2-2*Pi^2*b^2*d*csgn(I*
c*x^n)^6*m^2+4*ln(c)^2*b^2*e*x^m*m^2-16*ln(c)*b^2*d*m*n+16*ln(c)*a*b*d*m^2-
Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^4*x^m*m^2+2*Pi^2*b^2*e*csgn(I*x^n)*c
sgn(I*c*x^n)^5*x^m*m^2-8*I*Pi*ln(c)*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*m^2-8*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*m^2-2*I*Pi*b^2*e*m*
n*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m-2*I*Pi*b^2*e*m*n*csgn(I*c*x^n)^2*csgn(I*c
)*x^m+4*I*Pi*ln(c)*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m^2-4*I*Pi*a*b*e*c
sgn(I*c*x^n)^3*x^m*m^2+2*I*Pi*b^2*e*m*n*csgn(I*c*x^n)^3*x^m+8*I*Pi*ln(c)*b^
2*d*csgn(I*x^n)*csgn(I*c*x^n)^2*m^2+8*I*Pi*ln(c)*b^2*d*csgn(I*c*x^n)^2*csgn
(I*c)*m^2-4*I*Pi*a*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m^2+2*I*Pi*b
^2*e*m*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m-4*I*Pi*ln(c)*b^2*e*csgn(I*
c*x^n)^3*x^m*m^2+2*Pi^2*b^2*e*csgn(I*c*x^n)^5*csgn(I*c)*x^m*m^2-Pi^2*b^2*e*
csgn(I*c*x^n)^4*csgn(I*c)^2*x^m*m^2+8*ln(c)*a*b*e*x^m*m^2-4*ln(c)*b^2*e*m*n
*x^m-4*a*b*e*m*n*x^m-2*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^4*m^2+4*Pi^2*
b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^5*m^2+4*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x
^n)^3*csgn(I*c)*m^2-2*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*
m^2-8*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*m^2+4*Pi^2*b^2*d*csg
n(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*m^2+4*Pi^2*b^2*d*csgn(I*c*x^n)^5*csgn(
I*c)*m^2-2*Pi^2*b^2*d*csgn(I*c*x^n)^4*csgn(I*c)^2*m^2-Pi^2*b^2*e*csgn(I*c*x
^n)^6*x^m*m^2)*x/m^3*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I
*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3
+2*ln(f)+2*ln(x)))
```

maxima [A] time = 1.14, size = 257, normalized size = 1.14

$$\frac{b^2ef^{m-1}x^{2m}\log\left(cx^n\right)^2}{2m}+\frac{abef^{m-1}x^{2m}\log\left(cx^n\right)}{m}-2\left(\frac{f^{m-1}nx^m\log\left(cx^n\right)}{m^2}-\frac{f^{m-1}n^2x^m}{m^3}\right)b^2d-\frac{1}{4}\left(\frac{2f^{m-1}nx^{2m}\log\left(cx^n\right)}{m^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] 1/2*b^2*e*f^(m - 1)*x^(2*m)*log(c*x^n)^2/m + a*b*e*f^(m - 1)*x^(2*m)*log(c*
x^n)/m - 2*(f^(m - 1)*n*x^m*log(c*x^n)/m^2 - f^(m - 1)*n^2*x^m/m^3)*b^2*d -
 1/4*(2*f^(m - 1)*n*x^(2*m)*log(c*x^n)/m^2 - f^(m - 1)*n^2*x^(2*m)/m^3)*b^2
*e + 1/2*a^2*e*f^(m - 1)*x^(2*m)/m - 1/2*a*b*e*f^(m - 1)*n*x^(2*m)/m^2 - 2*
a*b*d*f^(m - 1)*n*x^m/m^2 + (f*x)^m*b^2*d*log(c*x^n)^2/(f*m) + 2*(f*x)^m*a*
b*d*log(c*x^n)/(f*m) + (f*x)^m*a^2*d/(f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(f\,x\right)}^{m-1}\,\left(d+e\,x^m\right)\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m - 1)*(d + e*x^m)*(a + b*log(c*x^n))^2,x)
```

```
[Out] int((f*x)^(m - 1)*(d + e*x^m)*(a + b*log(c*x^n))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)*(a+b*ln(c*x**n))**2,x)
```

```
[Out] Timed out
```

3.362 $\int (fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2\,dx$

Optimal. Leaf size=69

$$-\frac{2bn(fx)^m\left(a+b\log\left(cx^n\right)\right)}{fm^2}+\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^2}{fm}+\frac{2b^2n^2(fx)^m}{fm^3}$$

```
[Out] 2*b^2*n^2*(f*x)^m/f/m^3-2*b*n*(f*x)^m*(a+b*ln(c*x^n))/f/m^2+(f*x)^m*(a+b*ln
(c*x^n))^2/f/m
```

Rubi [A] time = 0.05, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2305, 2304}

$$-\frac{2bn(fx)^m\left(a+b\log\left(cx^n\right)\right)}{fm^2}+\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^2}{fm}+\frac{2b^2n^2(fx)^m}{fm^3}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b^2*n^2*(f*x)^m)/(f*m^3) - (2*b*n*(f*x)^m*(a + b*Log[c*x^n]))/(f*m^2) +
((f*x)^m*(a + b*Log[c*x^n])^2)/(f*m)
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\int (fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2\,dx &= \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^2}{fm}-\frac{(2bn)\int (fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)\,dx}{m}\\ &= \frac{2b^2n^2(fx)^m}{fm^3}-\frac{2bn(fx)^m\left(a+b\log\left(cx^n\right)\right)}{fm^2}+\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^2}{fm}\end{aligned}$$

Mathematica [A] time = 0.02, size = 67, normalized size = 0.97

$$\frac{(fx)^m\left(a^2m^2+2bm(am-bn)\log\left(cx^n\right)-2abmn+b^2m^2\log^2\left(cx^n\right)+2b^2n^2\right)}{fm^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] ((f*x)^m*(a^2*m^2 - 2*a*b*m*n + 2*b^2*n^2 + 2*b*m*(a*m - b*n)*Log[c*x^n] +
b^2*m^2*Log[c*x^n]^2))/(f*m^3)
```

fricas [A] time = 0.46, size = 124, normalized size = 1.80

$$\frac{\left(b^2m^2n^2x\log(x)^2 + b^2m^2x\log(c)^2 + 2\left(abm^2 - b^2mn\right)x\log(c) + \left(a^2m^2 - 2\,abmn + 2\,b^2n^2\right)x + 2\left(b^2m^2nx\log(c)\right.}{m^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] (b^2*m^2*n^2*x*log(x)^2 + b^2*m^2*x*log(c)^2 + 2*(a*b*m^2 - b^2*m*n)*x*log(
c) + (a^2*m^2 - 2*a*b*m*n + 2*b^2*n^2)*x + 2*(b^2*m^2*n*x*log(c) + (a*b*m^2
*n - b^2*m*n^2)*x)*log(x))*e^((m - 1)*log(f) + (m - 1)*log(x))/m^3
```

giac [B] time = 0.59, size = 222, normalized size = 3.22

$$\frac{b^2f^mn^2x^m\log(x)^2}{fm} + \frac{b^2\frac{1}{f}^m x^m|f|^{2m}\log(c)^2}{fm} + \frac{2\,b^2f^mnx^m\log(c)\log(x)}{fm} + \frac{2\,ab\frac{1}{f}^m x^m|f|^{2m}\log(c)}{fm} + \frac{2\,abf^mnx^m\log(x)}{fm} -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] b^2*f^m*n^2*x^m*log(x)^2/(f*m) + b^2*(1/f)^m*x^m*abs(f)^(2*m)*log(c)^2/(f*m
) + 2*b^2*f^m*n*x^m*log(c)*log(x)/(f*m) + 2*a*b*(1/f)^m*x^m*abs(f)^(2*m)*lo
g(c)/(f*m) + 2*a*b*f^m*n*x^m*log(x)/(f*m) - 2*b^2*f^m*n^2*x^m*log(x)/(f*m^2
) + a^2*(1/f)^m*x^m*abs(f)^(2*m)/(f*m) - 2*b^2*f^m*n*x^m*log(c)/(f*m^2) - 2
*a*b*f^m*n*x^m/(f*m^2) + 2*b^2*f^m*n^2*x^m/(f*m^3)
```

maple [C] time = 0.23, size = 1008, normalized size = 14.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(b*ln(c*x^n)+a)^2,x)
```

```
[Out] b^2/m*x*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)
*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln
(x)))*ln(x^n)^2+b*(-I*Pi*b*m*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+I*Pi*b*m*c
sgn(I*c)*csgn(I*c*x^n)^2+I*Pi*b*m*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*m*csgn
(I*c*x^n)^3+2*b*m*ln(c)+2*a*m-2*b*n)/m^2*x*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*c
sgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x
)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x)))*ln(x^n)+1/4*(4*b^2*m^2*ln(c)^2-Pi^
2*b^2*m^2*csgn(I*c*x^n)^6+8*b^2*n^2-8*a*b*m*n+4*a^2*m^2-Pi^2*b^2*m^2*csgn(I
*c*x^n)^4*csgn(I*c)^2-4*I*Pi*ln(c)*b^2*m^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)-4*I*Pi*a*b*m^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*I*Pi*b^2*m*n*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*I*Pi*a*b*m^2*csgn(I*c*x^n)^2*csgn(I*c)-4*I
*Pi*b^2*m*n*csgn(I*x^n)*csgn(I*c*x^n)^2+8*a*b*m^2*ln(c)-8*b^2*m*n*ln(c)-4*I
*Pi*b^2*m*n*csgn(I*c*x^n)^2*csgn(I*c)-Pi^2*b^2*m^2*csgn(I*x^n)^2*csgn(I*c*x
^n)^4+2*Pi^2*b^2*m^2*csgn(I*x^n)*csgn(I*c*x^n)^5+2*Pi^2*b^2*m^2*csgn(I*c*x^
n)^5*csgn(I*c)+2*Pi^2*b^2*m^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-Pi^2*
b^2*m^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-4*Pi^2*b^2*m^2*csgn(I*x^n
)*csgn(I*c*x^n)^4*csgn(I*c)+2*Pi^2*b^2*m^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn
(I*c)^2-4*I*Pi*ln(c)*b^2*m^2*csgn(I*c*x^n)^3-4*I*Pi*a*b*m^2*csgn(I*c*x^n)^3
+4*I*Pi*b^2*m*n*csgn(I*c*x^n)^3+4*I*Pi*ln(c)*b^2*m^2*csgn(I*x^n)*csgn(I*c*x
^n)^2+4*I*Pi*ln(c)*b^2*m^2*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*a*b*m^2*csgn(I*
x^n)*csgn(I*c*x^n)^2)/m^3*x*exp(1/2*(m-1)*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I
*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I
*f*x)^3+2*ln(f)+2*ln(x)))
```

maxima [A] time = 1.07, size = 117, normalized size = 1.70

$$-2\left(\frac{f^{m-1}nx^m\log\left(cx^n\right)}{m^2}-\frac{f^{m-1}n^2x^m}{m^3}\right)b^2-\frac{2\,abf^{m-1}nx^m}{m^2}+\frac{\left(fx\right)^m b^2\log\left(cx^n\right)^2}{fm}+\frac{2\,\left(fx\right)^m ab\log\left(cx^n\right)}{fm}+\frac{\left(fx\right)^m a^2}{fm}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] -2*(f^(m - 1)*n*x^m*log(c*x^n)/m^2 - f^(m - 1)*n^2*x^m/m^3)*b^2 - 2*a*b*f^(
m - 1)*n*x^m/m^2 + (f*x)^m*b^2*log(c*x^n)^2/(f*m) + 2*(f*x)^m*a*b*log(c*x^n
)/(f*m) + (f*x)^m*a^2/(f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(f\,x\right)^{m-1}\,\left(a+b\,\ln\left(c\,x^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m - 1)*(a + b*log(c*x^n))^2,x)
```

```
[Out] int((f*x)^(m - 1)*(a + b*log(c*x^n))^2, x)
```

sympy [A] time = 68.77, size = 490, normalized size = 7.10

$$\begin{cases} \tilde{\infty}\left(a^2x+2abnx\log\left(x\right)-2abnx+2abx\log\left(c\right)+b^2n^2x\log\left(x\right)^2-2b^2n^2x\log\left(x\right)+2b^2n^2x+2b^2nx\log\left(c\right)\log\left(x\right) \ldots \\ \frac{\begin{cases}\frac{a^2\log\left(cx^n\right)+ab\log\left(cx^n\right)^2+\frac{b^2\log\left(cx^n\right)^3}{3}}{n} & \text{for}\: n\neq 0\\ \left(a^2+2ab\log\left(c\right)+b^2\log\left(c\right)^2\right)\log\left(x\right) & \text{otherwise}\end{cases}}{f} \\ 0^{m-1}\left(a^2x+2abnx\log\left(x\right)-2abnx+2abx\log\left(c\right)+b^2n^2x\log\left(x\right)^2-2b^2n^2x\log\left(x\right)+2b^2n^2x+2b^2nx\log\left(c\right) \ldots \\ \frac{a^2f^mx^m}{fm}+\frac{2abf^mnx^m\log\left(x\right)}{fm}+\frac{2abf^mx^m\log\left(c\right)}{fm}-\frac{2abf^mnx^m}{fm^2}+\frac{b^2f^mn^2x^m\log\left(x\right)^2}{fm}+\frac{2b^2f^mnx^m\log\left(c\right)\log\left(x\right)}{fm}+\frac{b^2f^mx^m\log\left(c\right)^2}{fm}-\ldots \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))**2,x)
```

```
[Out] Piecewise((zoo*(a**2*x + 2*a*b*n*x*log(x) - 2*a*b*n*x + 2*a*b*x*log(c) + b*
*2*n**2*x*log(x)**2 - 2*b**2*n**2*x*log(x) + 2*b**2*n**2*x + 2*b**2*n*x*log
(c)*log(x) - 2*b**2*n*x*log(c) + b**2*x*log(c)**2), Eq(f, 0) & Eq(m, 0)), (
Piecewise(((a**2*log(c*x**n) + a*b*log(c*x**n)**2 + b**2*log(c*x**n)**3/3)/
n, Ne(n, 0)), ((a**2 + 2*a*b*log(c) + b**2*log(c)**2)*log(x), True))/f, Eq(
m, 0)), (0**(m - 1)*(a**2*x + 2*a*b*n*x*log(x) - 2*a*b*n*x + 2*a*b*x*log(c)
 + b**2*n**2*x*log(x)**2 - 2*b**2*n**2*x*log(x) + 2*b**2*n**2*x + 2*b**2*n*
x*log(c)*log(x) - 2*b**2*n*x*log(c) + b**2*x*log(c)**2), Eq(f, 0)), (a**2*f
**m*x**m/(f*m) + 2*a*b*f**m*n*x**m*log(x)/(f*m) + 2*a*b*f**m*x**m*log(c)/(f
*m) - 2*a*b*f**m*n*x**m/(f*m**2) + b**2*f**m*n**2*x**m*log(x)**2/(f*m) + 2*
b**2*f**m*n*x**m*log(c)*log(x)/(f*m) + b**2*f**m*x**m*log(c)**2/(f*m) - 2*b
**2*f**m*n**2*x**m*log(x)/(f*m**2) - 2*b**2*f**m*n*x**m*log(c)/(f*m**2) + 2
*b**2*f**m*n**2*x**m/(f*m**3), True))
```

3.363 $\int \frac{(fx)^{-1+m}\left(a+b\log(cx^n)\right)^2}{d+ex^m}\,dx$

Optimal. Leaf size=129

$$\frac{2bnx^{1-m}(fx)^{m-1}\text{Li}_2\left(-\frac{ex^m}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{em^2}+\frac{x^{1-m}(fx)^{m-1}\log\left(\frac{ex^m}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{em}-\frac{2b^2n^2x^{1-m}(fx)^{m-1}\text{Li}}{em^3}$$

```
[Out] x^(1-m)*(f*x)^(-1+m)*(a+b*ln(c*x^n))^2*ln(1+e*x^m/d)/e/m+2*b*n*x^(1-m)*(f*x
)^(-1+m)*(a+b*ln(c*x^n))*polylog(2,-e*x^m/d)/e/m^2-2*b^2*n^2*x^(1-m)*(f*x)^
(-1+m)*polylog(3,-e*x^m/d)/e/m^3
```

Rubi [A] time = 0.30, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.138, Rules used = {2339, 2337, 2374, 6589}

$$\frac{2bnx^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{ex^m}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{em^2}-\frac{2b^2n^2x^{1-m}(fx)^{m-1}\text{PolyLog}\left(3,-\frac{ex^m}{d}\right)}{em^3}+\frac{x^{1-m}(fx)^{m-1}\log\left(\frac{e}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m),x]
```

```
[Out] (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2*Log[1 + (e*x^m)/d])/(e*m) +
(2*b*n*x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*PolyLog[2, -((e*x^m)/d)]
)/(e*m^2) - (2*b^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*PolyLog[3, -((e*x^m)/d)])/(
e*m^3)
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{d+ex^m}\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{d+ex^m}\,dx$$
$$= \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex^m}{d}\right)}{em} - \frac{\left(2bnx^{1-m}(fx)^{-1+m}\right)\int \frac{(a+}{}}{em}$$
$$= \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex^m}{d}\right)}{em} + \frac{2bnx^{1-m}(fx)^{-1+m}\left(a+b\right.}{em^2}$$
$$= \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex^m}{d}\right)}{em} + \frac{2bnx^{1-m}(fx)^{-1+m}\left(a+b\right.}{em^2}$$

Mathematica [B] time = 0.27, size = 502, normalized size = 3.89

$$\frac{x^{-m}(fx)^m\left(3a^2m^2\log\left(d-dx^m\right)+3a^2m^3\log(x)-6bmn\text{Li}_2\left(\frac{ex^m}{d}+1\right)\left(a+b\log\left(cx^n\right)-bn\log(x)\right)+6abm^2\text{lo}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m),x]
```

```
[Out] ((f*x)^m*(3*a^2*m^3*Log[x] - 6*a*b*m^3*n*Log[x]^2 + 4*b^2*m^3*n^2*Log[x]^3
+ 6*a*b*m^3*Log[x]*Log[c*x^n] - 6*b^2*m^3*n*Log[x]^2*Log[c*x^n] + 3*b^2*m^3
*Log[x]*Log[c*x^n]^2 + 3*b^2*m^2*n^2*Log[x]^2*Log[1 + d/(e*x^m)] + 3*a^2*m^
2*Log[d - d*x^m] - 6*a*b*m^2*n*Log[x]*Log[d - d*x^m] + 3*b^2*m^2*n^2*Log[x]
^2*Log[d - d*x^m] + 6*a*b*m^2*Log[c*x^n]*Log[d - d*x^m] - 6*b^2*m^2*n*Log[x
]*Log[c*x^n]*Log[d - d*x^m] + 3*b^2*m^2*Log[c*x^n]^2*Log[d - d*x^m] + 6*a*b
*m^2*n*Log[x]*Log[d + e*x^m] - 6*b^2*m^2*n^2*Log[x]^2*Log[d + e*x^m] - 6*a*
b*m*n*Log[-((e*x^m)/d)]*Log[d + e*x^m] + 6*b^2*m*n^2*Log[x]*Log[-((e*x^m)/d
)]*Log[d + e*x^m] + 6*b^2*m^2*n*Log[x]*Log[c*x^n]*Log[d + e*x^m] - 6*b^2*m*
n*Log[-((e*x^m)/d)]*Log[c*x^n]*Log[d + e*x^m] - 6*b^2*m*n^2*Log[x]*PolyLog[
2, -(d/(e*x^m))] - 6*b*m*n*(a - b*n*Log[x] + b*Log[c*x^n])*PolyLog[2, 1 + (
e*x^m)/d] - 6*b^2*n^2*PolyLog[3, -(d/(e*x^m))]))/(3*e*f*m^3*x^m)
```

fricas [C] time = 0.47, size = 178, normalized size = 1.38

$$-\frac{2\,b^2f^{m-1}n^2\text{polylog}\left(3,-\frac{ex^m}{d}\right)-2\left(b^2mn^2\log(x)+b^2mn\log(c)+abmn\right)f^{m-1}\text{Li}_2\left(-\frac{ex^m+d}{d}+1\right)-\left(b^2m^2\log(c\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m),x, algorithm="fricas")
```

```
[Out] -(2*b^2*f^(m - 1)*n^2*polylog(3, -e*x^m/d) - 2*(b^2*m*n^2*log(x) + b^2*m*n*
log(c) + a*b*m*n)*f^(m - 1)*dilog(-(e*x^m + d)/d + 1) - (b^2*m^2*log(c)^2 +
 2*a*b*m^2*log(c) + a^2*m^2)*f^(m - 1)*log(e*x^m + d) - (b^2*m^2*n^2*log(x)
^2 + 2*(b^2*m^2*n*log(c) + a*b*m^2*n)*log(x))*f^(m - 1)*log((e*x^m + d)/d))
/(e*m^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2\left(fx\right)^{m-1}}{ex^m+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*(f*x)^(m - 1)/(e*x^m + d), x)
```

maple [F] time = 1.11, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^{n})+a)^{2}\left(fx\right)^{m-1}}{e\,x^{m}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(b*ln(c*x^n)+a)^2/(e*x^m+d),x)
```

```
[Out] int((f*x)^(m-1)*(b*ln(c*x^n)+a)^2/(e*x^m+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{a^{2}f^{m-1}\log\left(\frac{ex^{m}+d}{e}\right)}{em}+\int\frac{b^{2}f^{m}x^{m}\log\left(x^{n}\right)^{2}+2\left(b^{2}f^{m}\log(c)+abf^{m}\right)x^{m}\log\left(x^{n}\right)+\left(b^{2}f^{m}\log(c)^{2}+2\,abf^{m}\log(c)\right)}{efxx^{m}+dfx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m),x, algorithm="maxima")
```

```
[Out] a^2*f^(m - 1)*log((e*x^m + d)/e)/(e*m) + integrate((b^2*f^m*x^m*log(x^n)^2
+ 2*(b^2*f^m*log(c) + a*b*f^m)*x^m*log(x^n) + (b^2*f^m*log(c)^2 + 2*a*b*f^m
*log(c))*x^m)/(e*f*x*x^m + d*f*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(f\,x\right)^{m-1}\,\left(a+b\,\ln\left(c\,x^n\right)\right)^2}{d+e\,x^m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^(m - 1)*(a + b*log(c*x^n))^2)/(d + e*x^m),x)
```

```
[Out] int(((f*x)^(m - 1)*(a + b*log(c*x^n))^2)/(d + e*x^m), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(fx\right)^{m-1}\left(a+b\log\left(cx^{n}\right)\right)^{2}}{d+ex^{m}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))**2/(d+e*x**m),x)
```

```
[Out] Integral((f*x)**(m - 1)*(a + b*log(c*x**n))**2/(d + e*x**m), x)
```

3.364 $\int \frac{(fx)^{-1+m}\left(a+b\log(cx^n)\right)^2}{(d+ex^m)^2}\,dx$

Optimal. Leaf size=138

$$-\frac{2bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{dem^2}-\frac{x^{1-m}(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)^2}{em\left(d+ex^m\right)}+\frac{2b^2n^2x^{1-m}(fx)^{m-1}\mathrm{Li}_2\left(-\right.}{dem^3}$$

```
[Out] -x^(1-m)*(f*x)^(-1+m)*(a+b*ln(c*x^n))^2/e/m/(d+e*x^m)-2*b*n*x^(1-m)*(f*x)^(
-1+m)*(a+b*ln(c*x^n))*ln(1+d/e/(x^m))/d/e/m^2+2*b^2*n^2*x^(1-m)*(f*x)^(-1+m
)*polylog(2,-d/e/(x^m))/d/e/m^3
```

Rubi [A] time = 0.34, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.138, Rules used = {2339, 2338, 2345, 2391}

$$\frac{2b^2n^2x^{1-m}(fx)^{m-1}\mathrm{PolyLog}\left(2,-\frac{dx^{-m}}{e}\right)}{dem^3}-\frac{2bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{dem^2}-\frac{x^{1-m}(fx)^{m-1}\left(a+b\right.}{em\left(d+ex\right.}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^2,x]
```

```
[Out] -((x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(e*m*(d + e*x^m))) - (2*b
*n*x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*Log[1 + d/(e*x^m)])/(d*e*m^2
) + (2*b^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*PolyLog[2, -(d/(e*x^m))])/(d*e*m^3)
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex^m)^2}\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex^m)^2}\,dx$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{em\,(d+ex^m)} + \frac{\left(2bnx^{1-m}(fx)^{-1+m}\right)\int \frac{a+b\log(cx^n)}{x(d+ex^m)}\,dx}{em}$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{em\,(d+ex^m)} - \frac{2bnx^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)\log\left(\right.}{dem^2}$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{em\,(d+ex^m)} - \frac{2bnx^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)\log\left(\right.}{dem^2}$$

Mathematica [A] time = 0.45, size = 157, normalized size = 1.14

$$\frac{x^{-m}(fx)^m\left(-\frac{m^2\left(a+b\log(cx^n)\right)^2}{d+ex^m} - \frac{2abmn\log(d-dx^m)}{d} + \frac{2b^2mn\left(n\log(x)-\log(cx^n)\right)\log(d-dx^m)}{d} + \frac{2b^2n^2\left(\mathrm{Li}_2\left(\frac{ex^m}{d}+1\right)+\left(\log\left(-\frac{ex^m}{d}\right)-m\log(x)\right)\right.}{d}\right.}{efm^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^2,x]
```

```
[Out] ((f*x)^m*(-((m^2*(a + b*Log[c*x^n])^2)/(d + e*x^m)) - (2*a*b*m*n*Log[d - d*
x^m])/d + (2*b^2*m*n*(n*Log[x] - Log[c*x^n])*Log[d - d*x^m])/d + (2*b^2*n^2
*((m^2*Log[x]^2)/2 + (-(m*Log[x]) + Log[-((e*x^m)/d)])*Log[d + e*x^m] + Pol
yLog[2, 1 + (e*x^m)/d]))/d))/(e*f*m^3*x^m)
```

fricas [A] time = 0.44, size = 266, normalized size = 1.93

$$\frac{\left(b^2em^2n^2\log(x)^2 + 2\left(b^2em^2n\log(c) + abem^2n\right)\log(x)\right)f^{m-1}x^m - \left(b^2dm^2\log(c)^2 + 2\,abdm^2\log(c) + a^2dm^2\right)f^{m-}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^2,x, algorithm="fricas"
)
```

```
[Out] ((b^2*e*m^2*n^2*log(x)^2 + 2*(b^2*e*m^2*n*log(c) + a*b*e*m^2*n)*log(x))*f^(
m - 1)*x^m - (b^2*d*m^2*log(c)^2 + 2*a*b*d*m^2*log(c) + a^2*d*m^2)*f^(m - 1
) - 2*(b^2*e*f^(m - 1)*n^2*x^m + b^2*d*f^(m - 1)*n^2)*dilog(-(e*x^m + d)/d
+ 1) - 2*((b^2*e*m*n*log(c) + a*b*e*m*n)*f^(m - 1)*x^m + (b^2*d*m*n*log(c)
+ a*b*d*m*n)*f^(m - 1))*log(e*x^m + d) - 2*(b^2*e*f^(m - 1)*m*n^2*x^m*log(x
) + b^2*d*f^(m - 1)*m*n^2*log(x))*log((e*x^m + d)/d))/(d*e^2*m^3*x^m + d^2*
e*m^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2\left(fx\right)^{m-1}}{(ex^m+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*(f*x)^(m - 1)/(e*x^m + d)^2, x)
```

maple [F] time = 0.96, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n)+a)^2\left(f x\right)^{m-1}}{(e\,x^m+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(b*ln(c*x^n)+a)^2/(e*x^m+d)^2,x)
```

```
[Out] int((f*x)^(m-1)*(b*ln(c*x^n)+a)^2/(e*x^m+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\,abf^m n\left(\frac{\log(x)}{def m}-\frac{\log(ex^m+d)}{def m^2}\right)-\left(\frac{f^m\log(x^n)^2}{e^2fmx^m+def m}-\int\frac{ef^m mx^m\log(c)^2+2\left(df^m n+\left(ef^m m\log(c)+ef^m\right.\right.}{e^3fmxx^{2m}+2\,de^2fmxx^m+d^2efmx}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^2,x, algorithm="maxima"
)
```

```
[Out] 2*a*b*f^m*n*(log(x)/(d*e*f*m) - log(e*x^m + d)/(d*e*f*m^2)) - (f^m*log(x^n)
^2/(e^2*f*m*x^m + d*e*f*m) - integrate((e*f^m*m*x^m*log(c)^2 + 2*(d*f^m*n +
 (e*f^m*m*log(c) + e*f^m*n)*x^m)*log(x^n))/(e^3*f*m*x*x^(2*m) + 2*d*e^2*f*m
*x*x^m + d^2*e*f*m*x), x))*b^2 - 2*a*b*f^m*log(c*x^n)/(e^2*f*m*x^m + d*e*f*
m) - a^2*f^m/(e^2*f*m*x^m + d*e*f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(f\,x\right)^{m-1}\,\left(a+b\,\ln\left(c\,x^n\right)\right)^2}{\left(d+e\,x^m\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^(m - 1)*(a + b*log(c*x^n))^2)/(d + e*x^m)^2,x)
```

```
[Out] int(((f*x)^(m - 1)*(a + b*log(c*x^n))^2)/(d + e*x^m)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))**2/(d+e*x**m)**2,x)
```

```
[Out] Timed out
```

3.365 $\int \frac{(fx)^{-1+m}\left(a+b\log(cx^n)\right)^2}{(d+ex^m)^3}\,dx$

Optimal. Leaf size=214

$$-\frac{bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2em^2}-\frac{bnx(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{d^2m^2\left(d+ex^m\right)}-\frac{x^{1-m}(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)^2}{2em\left(d+ex^m\right)^2}+$$

```
[Out] -b*n*x*(f*x)^(-1+m)*(a+b*ln(c*x^n))/d^2/m^2/(d+e*x^m)-1/2*x^(1-m)*(f*x)^(-1
+m)*(a+b*ln(c*x^n))^2/e/m/(d+e*x^m)^2-b*n*x^(1-m)*(f*x)^(-1+m)*(a+b*ln(c*x^
n))*ln(1+d/e/(x^m))/d^2/e/m^2+b^2*n^2*x^(1-m)*(f*x)^(-1+m)*ln(d+e*x^m)/d^2/
e/m^3+b^2*n^2*x^(1-m)*(f*x)^(-1+m)*polylog(2,-d/e/(x^m))/d^2/e/m^3
```

Rubi [A] time = 0.51, antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {2339, 2338, 2349, 2345, 2391, 2335, 260}

$$\frac{b^2n^2x^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{dx^{-m}}{e}\right)}{d^2em^3}-\frac{bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2em^2}-\frac{bnx(fx)^{m-1}\left(a+b\log\left(c\right.\right.}{d^2m^2\left(d+ex^m\right)}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^3,x]
```

```
[Out] -((b*n*x*(f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d^2*m^2*(d + e*x^m))) - (x^(1
- m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(2*e*m*(d + e*x^m)^2) - (b*n*x^(1
 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*Log[1 + d/(e*x^m)])/(d^2*e*m^2) + (
b^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*Log[d + e*x^m])/(d^2*e*m^3) + (b^2*n^2*x^(
1 - m)*(f*x)^(-1 + m)*PolyLog[2, -(d/(e*x^m))])/(d^2*e*m^3)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex^m)^3}\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex^m)^3}\,dx$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{2em\left(d+ex^m\right)^2} + \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{a+b\log(cx^n)}{x(d+ex^m)^2}\,dx}{em}$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{2em\left(d+ex^m\right)^2} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}\left(a+b\log(cx^n)\right)}{(d+ex^m)^2}}{dm}$$

$$= -\frac{bnx(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{d^2m^2\left(d+ex^m\right)} - \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{2em\left(d+ex^m\right)^2} - \frac{bnx}{}$$

$$= -\frac{bnx(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{d^2m^2\left(d+ex^m\right)} - \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{2em\left(d+ex^m\right)^2} - \frac{bnx}{}$$

Mathematica [A] time = 0.36, size = 207, normalized size = 0.97

$$\frac{x^{-m}(fx)^m\left(-\frac{m^2\left(a+b\log(cx^n)\right)^2}{(d+ex^m)^2}+\frac{2bmn\left(a+b\log(cx^n)\right)}{d(d+ex^m)}-\frac{2abmn\log(d-dx^m)}{d^2}+\frac{2b^2mn\left(n\log(x)-\log(cx^n)\right)\log(d-dx^m)}{d^2}+\frac{2b^2n^2\left(\text{Li}_2\left(\frac{ex^m}{d}\right.\right.}{}\right.}{2efm^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^3,x]
```

```
[Out] ((f*x)^m*((2*b*m*n*(a + b*Log[c*x^n]))/(d*(d + e*x^m)) - (m^2*(a + b*Log[c*
x^n])^2)/(d + e*x^m)^2 - (2*a*b*m*n*Log[d - d*x^m])/d^2 + (2*b^2*n^2*Log[d
- d*x^m])/d^2 + (2*b^2*m*n*(n*Log[x] - Log[c*x^n])*Log[d - d*x^m])/d^2 + (2
*b^2*n^2*((m^2*Log[x]^2)/2 + (-(m*Log[x]) + Log[-((e*x^m)/d)])*Log[d + e*x^
m] + PolyLog[2, 1 + (e*x^m)/d]))/d^2))/(2*e*f*m^3*x^m)
```

fricas [B] time = 0.43, size = 535, normalized size = 2.50

$$\frac{\left(b^2e^2m^2n^2\log(x)^2+2\left(b^2e^2m^2n\log(c)+abe^2m^2n-b^2e^2mn^2\right)\log(x)\right)f^{m-1}x^{2m}+2\left(b^2dem^2n^2\log(x)^2+b^2de\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^3,x, algorithm="fricas"
)
```

```
[Out] 1/2*((b^2*e^2*m^2*n^2*log(x)^2 + 2*(b^2*e^2*m^2*n*log(c) + a*b*e^2*m^2*n -
b^2*e^2*m*n^2)*log(x))*f^(m - 1)*x^(2*m) + 2*(b^2*d*e*m^2*n^2*log(x)^2 + b^
2*d*e*m*n*log(c) + a*b*d*e*m*n + (2*b^2*d*e*m^2*n*log(c) + 2*a*b*d*e*m^2*n
- b^2*d*e*m*n^2)*log(x))*f^(m - 1)*x^m - (b^2*d^2*m^2*log(c)^2 + a^2*d^2*m^
2 - 2*a*b*d^2*m*n + 2*(a*b*d^2*m^2 - b^2*d^2*m*n)*log(c))*f^(m - 1) - 2*(b^
2*e^2*f^(m - 1)*n^2*x^(2*m) + 2*b^2*d*e*f^(m - 1)*n^2*x^m + b^2*d^2*f^(m -
1)*n^2)*dilog(-(e*x^m + d)/d + 1) - 2*((b^2*e^2*m*n*log(c) + a*b*e^2*m*n -
b^2*e^2*n^2)*f^(m - 1)*x^(2*m) + 2*(b^2*d*e*m*n*log(c) + a*b*d*e*m*n - b^2*
d*e*n^2)*f^(m - 1)*x^m + (b^2*d^2*m*n*log(c) + a*b*d^2*m*n - b^2*d^2*n^2)*f
^(m - 1))*log(e*x^m + d) - 2*(b^2*e^2*f^(m - 1)*m*n^2*x^(2*m)*log(x) + 2*b^
2*d*e*f^(m - 1)*m*n^2*x^m*log(x) + b^2*d^2*f^(m - 1)*m*n^2*log(x))*log((e*x
^m + d)/d))/(d^2*e^3*m^3*x^(2*m) + 2*d^3*e^2*m^3*x^m + d^4*e*m^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)^{2}\left(fx\right)^{m-1}}{\left(ex^{m}+d\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*(f*x)^(m - 1)/(e*x^m + d)^3, x)
```

maple [F] time = 0.95, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^{n}\right)+a\right)^{2}\left(fx\right)^{m-1}}{\left(e\,x^{m}+d\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(b*ln(c*x^n)+a)^2/(e*x^m+d)^3,x)
```

```
[Out] int((f*x)^(m-1)*(b*ln(c*x^n)+a)^2/(e*x^m+d)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$abf^{m}n\left(\frac{1}{\left(de^{2}fmx^{m}+d^{2}efm\right)m}+\frac{\log(x)}{d^{2}efm}-\frac{\log\left(ex^{m}+d\right)}{d^{2}efm^{2}}\right)-\frac{1}{2}\left(\frac{f^{m}\log\left(x^{n}\right)^{2}}{e^{3}fmx^{2m}+2\,de^{2}fmx^{m}+d^{2}efm}-2\int\frac{ef^{m}mx^{m}}{e^{4}f}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^3,x, algorithm="maxima"
)
```

```
[Out] a*b*f^m*n*(1/((d*e^2*f*m*x^m + d^2*e*f*m)*m) + log(x)/(d^2*e*f*m) - log(e*x
^m + d)/(d^2*e*f*m^2)) - 1/2*(f^m*log(x^n)^2/(e^3*f*m*x^(2*m) + 2*d*e^2*f*m
*x^m + d^2*e*f*m) - 2*integrate((e*f^m*m*x^m*log(c)^2 + (d*f^m*n + (2*e*f^m
*m*log(c) + e*f^m*n)*x^m)*log(x^n))/(e^4*f*m*x*x^(3*m) + 3*d*e^3*f*m*x*x^(2
*m) + 3*d^2*e^2*f*m*x*x^m + d^3*e*f*m*x), x))*b^2 - a*b*f^m*log(c*x^n)/(e^3
*f*m*x^(2*m) + 2*d*e^2*f*m*x^m + d^2*e*f*m) - 1/2*a^2*f^m/(e^3*f*m*x^(2*m)
+ 2*d*e^2*f*m*x^m + d^2*e*f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(f\,x\right)^{m-1}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)^{2}}{\left(d+e\,x^{m}\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^(m - 1)*(a + b*log(c*x^n))^2)/(d + e*x^m)^3,x)
[Out] int(((f*x)^(m - 1)*(a + b*log(c*x^n))^2)/(d + e*x^m)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))**2/(d+e*x**m)**3,x)
[Out] Timed out
```

3.366 $\int \frac{(fx)^{-1+m}\left(a+b\log(cx^n)\right)^2}{(d+ex^m)^4}\,dx$

Optimal. Leaf size=346

$$-\frac{2bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{3d^3em^2}-\frac{2bnx(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{3d^3m^2\left(d+ex^m\right)}+\frac{bnx^{1-m}(fx)^{m-1}\left(a+b\log\left(cx\right.\right.}{3dem^2\left(d+ex^m\right)^2}$$

```
[Out] -1/3*b^2*n^2*x^(1-m)*(f*x)^(-1+m)/d^2/e/m^3/(d+e*x^m)-1/3*b^2*n^2*x^(1-m)*(
f*x)^(-1+m)*ln(x)/d^3/e/m^2+1/3*b*n*x^(1-m)*(f*x)^(-1+m)*(a+b*ln(c*x^n))/d/
e/m^2/(d+e*x^m)^2-2/3*b*n*x*(f*x)^(-1+m)*(a+b*ln(c*x^n))/d^3/m^2/(d+e*x^m)-
1/3*x^(1-m)*(f*x)^(-1+m)*(a+b*ln(c*x^n))^2/e/m/(d+e*x^m)^3-2/3*b*n*x^(1-m)*
(f*x)^(-1+m)*(a+b*ln(c*x^n))*ln(1+d/e/(x^m))/d^3/e/m^2+b^2*n^2*x^(1-m)*(f*x
)^(-1+m)*ln(d+e*x^m)/d^3/e/m^3+2/3*b^2*n^2*x^(1-m)*(f*x)^(-1+m)*polylog(2,-
d/e/(x^m))/d^3/e/m^3
```

Rubi [A] time = 0.71, antiderivative size = 346, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.310, Rules used = {2339, 2338, 2349, 2345, 2391, 2335, 260, 266, 44}

$$\frac{2b^2n^2x^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{dx^{-m}}{e}\right)}{3d^3em^3}-\frac{2bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{3d^3em^2}-\frac{2bnx(fx)^{m-1}\left(a+b\log\right.}{3d^3m^2\left(d+ex^m\right.}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^4,x]
```

```
[Out] -(b^2*n^2*x^(1 - m)*(f*x)^(-1 + m))/(3*d^2*e*m^3*(d + e*x^m)) - (b^2*n^2*x^
(1 - m)*(f*x)^(-1 + m)*Log[x])/(3*d^3*e*m^2) + (b*n*x^(1 - m)*(f*x)^(-1 + m
)*(a + b*Log[c*x^n]))/(3*d*e*m^2*(d + e*x^m)^2) - (2*b*n*x*(f*x)^(-1 + m)*(
a + b*Log[c*x^n]))/(3*d^3*m^2*(d + e*x^m)) - (x^(1 - m)*(f*x)^(-1 + m)*(a +
 b*Log[c*x^n])^2)/(3*e*m*(d + e*x^m)^3) - (2*b*n*x^(1 - m)*(f*x)^(-1 + m)*(
a + b*Log[c*x^n])*Log[1 + d/(e*x^m)])/(3*d^3*e*m^2) + (b^2*n^2*x^(1 - m)*(f
*x)^(-1 + m)*Log[d + e*x^m])/(d^3*e*m^3) + (2*b^2*n^2*x^(1 - m)*(f*x)^(-1 +
 m)*PolyLog[2, -(d/(e*x^m))])/(3*d^3*e*m^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
```

```
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(fx)^{-1+m}\left(a+b\log(cx^n)\right)^2}{(d+ex^m)^4}\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}\left(a+b\log(cx^n)\right)^2}{(d+ex^m)^4}\,dx$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log(cx^n)\right)^2}{3em(d+ex^m)^3} + \frac{\left(2bnx^{1-m}(fx)^{-1+m}\right)\int \frac{a+b\log(cx^n)}{x(d+ex^m)^3}\,dx}{3em}$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log(cx^n)\right)^2}{3em(d+ex^m)^3} - \frac{\left(2bnx^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}\left(a+b\log(cx^n)\right)}{(d+ex^m)^3}\,d}{3dm}$$

$$= \frac{bnx^{1-m}(fx)^{-1+m}\left(a+b\log(cx^n)\right)}{3dem^2(d+ex^m)^2} - \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log(cx^n)\right)^2}{3em(d+ex^m)^3} - \frac{(2bn}{}$$

$$= \frac{bnx^{1-m}(fx)^{-1+m}\left(a+b\log(cx^n)\right)}{3dem^2(d+ex^m)^2} - \frac{2bnx(fx)^{-1+m}\left(a+b\log(cx^n)\right)}{3d^3m^2(d+ex^m)} - \frac{x^{1-m}(}{}$$

$$= \frac{bnx^{1-m}(fx)^{-1+m}\left(a+b\log(cx^n)\right)}{3dem^2(d+ex^m)^2} - \frac{2bnx(fx)^{-1+m}\left(a+b\log(cx^n)\right)}{3d^3m^2(d+ex^m)} - \frac{x^{1-m}(}{}$$

$$= -\frac{b^2n^2x^{1-m}(fx)^{-1+m}}{3d^2em^3(d+ex^m)} - \frac{b^2n^2x^{1-m}(fx)^{-1+m}\log(x)}{3d^3em^2} + \frac{bnx^{1-m}(fx)^{-1+m}\left(a+b\,\mathrm{lo}\right.}{3dem^2(d+ex^m)^2}$$

Mathematica [**A**] time = 0.53, size = 240, normalized size = 0.69

$$\frac{x^{-m}(fx)^m\left(\frac{bn\left(2am+2bm\log(cx^n)-bn\right)}{d^2(d+ex^m)} - \frac{m^2\left(a+b\log(cx^n)\right)^2}{(d+ex^m)^3} + \frac{bmn\left(a+b\log(cx^n)\right)}{d(d+ex^m)^2} - \frac{2abmn\log(d-dx^m)}{d^3} + \frac{2b^2mn\left(n\log(x)-\log(cx^n)\right)\log(d-}{d^3}\right.}{3efm^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^4,x]
```

```
[Out] ((f*x)^m*((b*m*n*(a + b*Log[c*x^n]))/(d*(d + e*x^m)^2) - (m^2*(a + b*Log[c*
x^n])^2)/(d + e*x^m)^3 + (b*n*(2*a*m - b*n + 2*b*m*Log[c*x^n]))/(d^2*(d + e
*x^m)) - (2*a*b*m*n*Log[d - d*x^m])/d^3 + (3*b^2*n^2*Log[d - d*x^m])/d^3 +
(2*b^2*m*n*(n*Log[x] - Log[c*x^n])*Log[d - d*x^m])/d^3 + (2*b^2*n^2*((m^2*L
og[x]^2)/2 + (-(m*Log[x]) + Log[-((e*x^m)/d)])*Log[d + e*x^m] + PolyLog[2,
1 + (e*x^m)/d]))/d^3))/(3*e*f*m^3*x^m)
```

fricas [**B**] time = 0.49, size = 810, normalized size = 2.34

$$\left(b^2e^3m^2n^2\log(x)^2 + \left(2\,b^2e^3m^2n\log(c) + 2\,abe^3m^2n - 3\,b^2e^3mn^2\right)\log(x)\right)f^{m-1}x^{3\,m} + \left(3\,b^2de^2m^2n^2\log(x)^2 + 2\,b^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^4,x, algorithm="fricas"
)
```

```
[Out] 1/3*((b^2*e^3*m^2*n^2*log(x)^2 + (2*b^2*e^3*m^2*n*log(c) + 2*a*b*e^3*m^2*n
- 3*b^2*e^3*m*n^2)*log(x))*f^(m - 1)*x^(3*m) + (3*b^2*d*e^2*m^2*n^2*log(x)^
2 + 2*b^2*d*e^2*m*n*log(c) + 2*a*b*d*e^2*m*n - b^2*d*e^2*n^2 + (6*b^2*d*e^2
*m^2*n*log(c) + 6*a*b*d*e^2*m^2*n - 7*b^2*d*e^2*m*n^2)*log(x))*f^(m - 1)*x^
(2*m) + (3*b^2*d^2*e*m^2*n^2*log(x)^2 + 5*b^2*d^2*e*m*n*log(c) + 5*a*b*d^2*
```

```
e*m*n - 2*b^2*d^2*e*n^2 + 2*(3*b^2*d^2*e*m^2*n*log(c) + 3*a*b*d^2*e*m^2*n -
 2*b^2*d^2*e*m*n^2)*log(x))*f^(m - 1)*x^m - (b^2*d^3*m^2*log(c)^2 + a^2*d^3
*m^2 - 3*a*b*d^3*m*n + b^2*d^3*n^2 + (2*a*b*d^3*m^2 - 3*b^2*d^3*m*n)*log(c)
)*f^(m - 1) - 2*(b^2*e^3*f^(m - 1)*n^2*x^(3*m) + 3*b^2*d*e^2*f^(m - 1)*n^2*
x^(2*m) + 3*b^2*d^2*e*f^(m - 1)*n^2*x^m + b^2*d^3*f^(m - 1)*n^2)*dilog(-(e*
x^m + d)/d + 1) - ((2*b^2*e^3*m*n*log(c) + 2*a*b*e^3*m*n - 3*b^2*e^3*n^2)*f
^(m - 1)*x^(3*m) + 3*(2*b^2*d*e^2*m*n*log(c) + 2*a*b*d*e^2*m*n - 3*b^2*d*e^
2*n^2)*f^(m - 1)*x^(2*m) + 3*(2*b^2*d^2*e*m*n*log(c) + 2*a*b*d^2*e*m*n - 3*
b^2*d^2*e*n^2)*f^(m - 1)*x^m + (2*b^2*d^3*m*n*log(c) + 2*a*b*d^3*m*n - 3*b^
2*d^3*n^2)*f^(m - 1))*log(e*x^m + d) - 2*(b^2*e^3*f^(m - 1)*m*n^2*x^(3*m)*l
og(x) + 3*b^2*d*e^2*f^(m - 1)*m*n^2*x^(2*m)*log(x) + 3*b^2*d^2*e*f^(m - 1)*
m*n^2*x^m*log(x) + b^2*d^3*f^(m - 1)*m*n^2*log(x))*log((e*x^m + d)/d))/(d^3
*e^4*m^3*x^(3*m) + 3*d^4*e^3*m^3*x^(2*m) + 3*d^5*e^2*m^3*x^m + d^6*e*m^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log\left(cx^{n}\right) + a\right)^{2} \left(fx\right)^{m-1}}{\left(ex^{m} + d\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*(f*x)^(m - 1)/(e*x^m + d)^4, x)
```

maple [F] time = 0.98, size = 0, normalized size = 0.00

$$\int \frac{\left(b \ln\left(c\,x^{n}\right) + a\right)^{2} \left(fx\right)^{m-1}}{\left(e\,x^{m} + d\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(m-1)*(b*ln(c*x^n)+a)^2/(e*x^m+d)^4,x)
```

```
[Out] int((f*x)^(m-1)*(b*ln(c*x^n)+a)^2/(e*x^m+d)^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\,abf^{m}n\left(\frac{2\,ex^{m} + 3\,d}{\left(d^{2}e^{3}fmx^{2\,m} + 2\,d^{3}e^{2}fmx^{m} + d^{4}efm\right)m} + \frac{2\,\log(x)}{d^{3}efm} - \frac{2\,\log\left(ex^{m} + d\right)}{d^{3}efm^{2}}\right) - \frac{1}{3}\left(\frac{f^{m}\,\mathrm{lo}}{e^{4}fmx^{3\,m} + 3\,de^{3}fmx^{2\,m}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^4,x, algorithm="maxima"
)
```

```
[Out] 1/3*a*b*f^m*n*((2*e*x^m + 3*d)/((d^2*e^3*f*m*x^(2*m) + 2*d^3*e^2*f*m*x^m +
d^4*e*f*m)*m) + 2*log(x)/(d^3*e*f*m) - 2*log(e*x^m + d)/(d^3*e*f*m^2)) - 1/
3*(f^m*log(x^n)^2/(e^4*f*m*x^(3*m) + 3*d*e^3*f*m*x^(2*m) + 3*d^2*e^2*f*m*x^
m + d^3*e*f*m) - 3*integrate(1/3*(3*e*f^m*m*x^m*log(c)^2 + 2*(d*f^m*n + (3*
e*f^m*m*log(c) + e*f^m*n)*x^m)*log(x^n))/(e^5*f*m*x*x^(4*m) + 4*d*e^4*f*m*x
*x^(3*m) + 6*d^2*e^3*f*m*x*x^(2*m) + 4*d^3*e^2*f*m*x*x^m + d^4*e*f*m*x), x)
)*b^2 - 2/3*a*b*f^m*log(c*x^n)/(e^4*f*m*x^(3*m) + 3*d*e^3*f*m*x^(2*m) + 3*d
^2*e^2*f*m*x^m + d^3*e*f*m) - 1/3*a^2*f^m/(e^4*f*m*x^(3*m) + 3*d*e^3*f*m*x^
(2*m) + 3*d^2*e^2*f*m*x^m + d^3*e*f*m)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(f\,x\right)^{m-1}\,\left(a + b\,\ln\left(c\,x^{n}\right)\right)^{2}}{\left(d + e\,x^{m}\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^(m - 1)*(a + b*log(c*x^n))^2)/(d + e*x^m)^4,x)
```

```
[Out] int(((f*x)^(m - 1)*(a + b*log(c*x^n))^2)/(d + e*x^m)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))**2/(d+e*x**m)**4,x)
```

```
[Out] Timed out
```

3.367 $\int x^5 (d+ex^r) \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=59

$$\frac{1}{6}\left(dx^6+\frac{6ex^{r+6}}{r+6}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{36}bdnx^6-\frac{benx^{r+6}}{(r+6)^2}$$

```
[Out] -1/36*b*d*n*x^6-b*e*n*x^(6+r)/(6+r)^2+1/6*(d*x^6+6*e*x^(6+r)/(6+r))*(a+b*ln
(c*x^n))
```

Rubi [A] time = 0.08, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$\frac{1}{6}\left(dx^6+\frac{6ex^{r+6}}{r+6}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{36}bdnx^6-\frac{benx^{r+6}}{(r+6)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^6)/36 - (b*e*n*x^(6 + r))/(6 + r)^2 + ((d*x^6 + (6*e*x^(6 + r))/(
6 + r))*(a + b*Log[c*x^n]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] && !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int x^5 (d+ex^r)\left(a+b\log\left(cx^n\right)\right) dx &= \frac{1}{6}\left(dx^6+\frac{6ex^{6+r}}{6+r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{1}{6}x^5\left(d+\frac{6ex^r}{6+r}\right) dx\\
&= \frac{1}{6}\left(dx^6+\frac{6ex^{6+r}}{6+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{6}(bn)\int x^5\left(d+\frac{6ex^r}{6+r}\right) dx\\
&= \frac{1}{6}\left(dx^6+\frac{6ex^{6+r}}{6+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{6}(bn)\int \left(dx^5+\frac{6ex^{5+r}}{6+r}\right) dx\\
&= -\frac{1}{36}bdnx^6-\frac{benx^{6+r}}{(6+r)^2}+\frac{1}{6}\left(dx^6+\frac{6ex^{6+r}}{6+r}\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.11, size = 73, normalized size = 1.24

$$\frac{x^6\left(6a(r+6)(d(r+6)+6ex^r)+6b(r+6)\log\left(cx^n\right)(d(r+6)+6ex^r)-bn\left(d(r+6)^2+36ex^r\right)\right)}{36(r+6)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^6*(6*a*(6 + r)*(d*(6 + r) + 6*e*x^r) - b*n*(d*(6 + r)^2 + 36*e*x^r) + 6*
b*(6 + r)*(d*(6 + r) + 6*e*x^r)*Log[c*x^n]))/(36*(6 + r)^2)
```

fricas [B] time = 0.47, size = 159, normalized size = 2.69

$$\frac{6\left(bdr^2+12\,bdr+36\,bd\right)x^6\log(c)+6\left(bdnr^2+12\,bdnr+36\,bdn\right)x^6\log(x)-\left(36\,bdn+(bdn-6\,ad)r^2-216\,ad+\cdots\right.}{36\left(r^2+12\,r+3\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/36*(6*(b*d*r^2 + 12*b*d*r + 36*b*d)*x^6*log(c) + 6*(b*d*n*r^2 + 12*b*d*n*
r + 36*b*d*n)*x^6*log(x) - (36*b*d*n + (b*d*n - 6*a*d)*r^2 - 216*a*d + 12*(
b*d*n - 6*a*d)*r)*x^6 + 36*((b*e*r + 6*b*e)*x^6*log(c) + (b*e*n*r + 6*b*e*n
)*x^6*log(x) - (b*e*n - a*e*r - 6*a*e)*x^6)*x^r)/(r^2 + 12*r + 36)
```

giac [B] time = 0.35, size = 137, normalized size = 2.32

$$\frac{bnrx^6x^re\log(x)}{r^2+12\,r+36}+\frac{1}{6}\,bdnx^6\log(x)+\frac{6\,bnx^6x^re\log(x)}{r^2+12\,r+36}-\frac{1}{36}\,bdnx^6-\frac{bnx^6x^re}{r^2+12\,r+36}+\frac{1}{6}\,bdx^6\log(c)+\frac{bx^6x^re\log(c)}{r+6}+\frac{1}{6}\,a\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x^6*x^r*e*log(x)/(r^2 + 12*r + 36) + 1/6*b*d*n*x^6*log(x) + 6*b*n*x^6
*x^r*e*log(x)/(r^2 + 12*r + 36) - 1/36*b*d*n*x^6 - b*n*x^6*x^r*e/(r^2 + 12*
r + 36) + 1/6*b*d*x^6*log(c) + b*x^6*x^r*e*log(c)/(r + 6) + 1/6*a*d*x^6 + a
*x^6*x^r*e/(r + 6)
```

maple [C] time = 0.27, size = 613, normalized size = 10.39

$$\frac{(dr+6e\,x^r+6d)\,b\,x^6\ln(x^n)}{36+6r}-\frac{\left(36bdn-216ae\,x^r-36aer\,x^r+36ben\,x^r-6bd\,r^2\ln(c)-72bdr\ln(c)-216be\,x^r\ln(c\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d+e*x^r)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/6*x^6*b*(d*r+6*e*x^r+6*d)/(6+r)*ln(x^n)-1/36*x^6*(36*b*d*n-216*x^r*a*e-36
*x^r*a*e*r+36*x^r*b*e*n-6*ln(c)*b*d*r^2-72*ln(c)*b*d*r-216*ln(c)*b*e*x^r-72
*a*d*r-216*a*d+b*d*n*r^2-6*a*d*r^2+12*b*d*n*r-216*b*d*ln(c)-3*I*Pi*b*d*r^2*
csgn(I*x^n)*csgn(I*c*x^n)^2+18*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*x^r*r-18*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r-3*I*Pi*b*d*r^2*csgn(I*c*
x^n)^2*csgn(I*c)+108*I*Pi*b*d*csgn(I*c*x^n)^3-36*ln(c)*b*e*x^r*r+36*I*Pi*b*
d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*r+3*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)+108*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-18*I*P
i*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r+36*I*Pi*b*d*csgn(I*c*x^n)^3*r+3*I*P
i*b*d*r^2*csgn(I*c*x^n)^3+108*I*Pi*b*e*csgn(I*c*x^n)^3*x^r-108*I*Pi*b*d*csg
n(I*c*x^n)^2*csgn(I*c)-108*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-36*I*Pi*b*d
*csgn(I*x^n)*csgn(I*c*x^n)^2*r-36*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*r-108*
I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-108*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(
I*c)*x^r+18*I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r+108*I*Pi*b*d*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c))/(6+r)^2
```

maxima [A] time = 0.96, size = 76, normalized size = 1.29

$$-\frac{1}{36}\,bdnx^6+\frac{1}{6}\,bdx^6\log\left(cx^n\right)+\frac{1}{6}\,adx^6+\frac{bex^{r+6}\log\left(cx^n\right)}{r+6}-\frac{benx^{r+6}}{(r+6)^2}+\frac{aex^{r+6}}{r+6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/36*b*d*n*x^6 + 1/6*b*d*x^6*log(c*x^n) + 1/6*a*d*x^6 + b*e*x^(r + 6)*log(
c*x^n)/(r + 6) - b*e*n*x^(r + 6)/(r + 6)^2 + a*e*x^(r + 6)/(r + 6)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int x^5\,\left(d+e\,x^r\right)\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d + e*x^r)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^5*(d + e*x^r)*(a + b*log(c*x^n)), x)
```

sympy [A] time = 141.14, size = 525, normalized size = 8.90

$$\begin{cases} \frac{6adr^2x^6}{36r^2+432r+1296} + \frac{72adrx^6}{36r^2+432r+1296} + \frac{216adx^6}{36r^2+432r+1296} + \frac{36aerx^6x^r}{36r^2+432r+1296} + \frac{216aex^6x^r}{36r^2+432r+1296} + \frac{6bdnr^2x^6\log(x)}{36r^2+432r+1296} - \frac{bdnr^2x^6}{36r^2+432r+12\cdots} \\ \frac{adx^6}{6} + ae\log(x) + \frac{bdnx^6\log(x)}{6} - \frac{bdnx^6}{36} + \frac{bdx^6\log(c)}{6} + \frac{ben\log(x)^2}{2} + be\log(c)\log(x) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((6*a*d*r**2*x**6/(36*r**2 + 432*r + 1296) + 72*a*d*r*x**6/(36*r**
2 + 432*r + 1296) + 216*a*d*x**6/(36*r**2 + 432*r + 1296) + 36*a*e*r*x**6*x
**r/(36*r**2 + 432*r + 1296) + 216*a*e*x**6*x**r/(36*r**2 + 432*r + 1296) +
 6*b*d*n*r**2*x**6*log(x)/(36*r**2 + 432*r + 1296) - b*d*n*r**2*x**6/(36*r*
*2 + 432*r + 1296) + 72*b*d*n*r*x**6*log(x)/(36*r**2 + 432*r + 1296) - 12*b
*d*n*r*x**6/(36*r**2 + 432*r + 1296) + 216*b*d*n*x**6*log(x)/(36*r**2 + 432
*r + 1296) - 36*b*d*n*x**6/(36*r**2 + 432*r + 1296) + 6*b*d*r**2*x**6*log(c
)/(36*r**2 + 432*r + 1296) + 72*b*d*r*x**6*log(c)/(36*r**2 + 432*r + 1296)
+ 216*b*d*x**6*log(c)/(36*r**2 + 432*r + 1296) + 36*b*e*n*r*x**6*x**r*log(x
)/(36*r**2 + 432*r + 1296) + 216*b*e*n*x**6*x**r*log(x)/(36*r**2 + 432*r +
1296) - 36*b*e*n*x**6*x**r/(36*r**2 + 432*r + 1296) + 36*b*e*r*x**6*x**r*lo
g(c)/(36*r**2 + 432*r + 1296) + 216*b*e*x**6*x**r*log(c)/(36*r**2 + 432*r +
 1296), Ne(r, -6)), (a*d*x**6/6 + a*e*log(x) + b*d*n*x**6*log(x)/6 - b*d*n*
x**6/36 + b*d*x**6*log(c)/6 + b*e*n*log(x)**2/2 + b*e*log(c)*log(x), True))
```

3.368 $\int x^3 (d + ex^r) \left(a + b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=59

$$\frac{1}{4}\left(dx^4 + \frac{4ex^{r+4}}{r+4}\right)\left(a + b\log\left(cx^n\right)\right) - \frac{1}{16}bdnx^4 - \frac{benx^{r+4}}{(r+4)^2}$$

```
[Out] -1/16*b*d*n*x^4-b*e*n*x^(4+r)/(4+r)^2+1/4*(d*x^4+4*e*x^(4+r)/(4+r))*(a+b*ln
(c*x^n))
```

Rubi [A] time = 0.08, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$\frac{1}{4}\left(dx^4 + \frac{4ex^{r+4}}{r+4}\right)\left(a + b\log\left(cx^n\right)\right) - \frac{1}{16}bdnx^4 - \frac{benx^{r+4}}{(r+4)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^4)/16 - (b*e*n*x^(4 + r))/(4 + r)^2 + ((d*x^4 + (4*e*x^(4 + r))/(
4 + r))*(a + b*Log[c*x^n]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int x^3 (d + ex^r) \left(a + b\log\left(cx^n\right)\right) dx &= \frac{1}{4}\left(dx^4 + \frac{4ex^{4+r}}{4+r}\right)\left(a + b\log\left(cx^n\right)\right) - (bn)\int \frac{1}{4}x^3\left(d + \frac{4ex^r}{4+r}\right) dx \\
&= \frac{1}{4}\left(dx^4 + \frac{4ex^{4+r}}{4+r}\right)\left(a + b\log\left(cx^n\right)\right) - \frac{1}{4}(bn)\int x^3\left(d + \frac{4ex^r}{4+r}\right) dx \\
&= \frac{1}{4}\left(dx^4 + \frac{4ex^{4+r}}{4+r}\right)\left(a + b\log\left(cx^n\right)\right) - \frac{1}{4}(bn)\int \left(dx^3 + \frac{4ex^{3+r}}{4+r}\right) dx \\
&= -\frac{1}{16}bdnx^4 - \frac{benx^{4+r}}{(4+r)^2} + \frac{1}{4}\left(dx^4 + \frac{4ex^{4+r}}{4+r}\right)\left(a + b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.10, size = 73, normalized size = 1.24

$$\frac{x^4\left(4a(r+4)\left(d(r+4)+4ex^r\right)+4b(r+4)\log\left(cx^n\right)\left(d(r+4)+4ex^r\right)-bn\left(d(r+4)^2+16ex^r\right)\right)}{16(r+4)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(4*a*(4 + r)*(d*(4 + r) + 4*e*x^r) - b*n*(d*(4 + r)^2 + 16*e*x^r) + 4*
b*(4 + r)*(d*(4 + r) + 4*e*x^r)*Log[c*x^n]))/(16*(4 + r)^2)
```

fricas [B] time = 0.44, size = 159, normalized size = 2.69

$$\frac{4\left(bdr^2+8\,bdr+16\,bd\right)x^4\log(c)+4\left(bdnr^2+8\,bdnr+16\,bdn\right)x^4\log(x)-\left(16\,bdn+(bdn-4\,ad)r^2-64\,ad+\right.}{16\left(r^2+8\,r+1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/16*(4*(b*d*r^2 + 8*b*d*r + 16*b*d)*x^4*log(c) + 4*(b*d*n*r^2 + 8*b*d*n*r
+ 16*b*d*n)*x^4*log(x) - (16*b*d*n + (b*d*n - 4*a*d)*r^2 - 64*a*d + 8*(b*d*
n - 4*a*d)*r)*x^4 + 16*((b*e*r + 4*b*e)*x^4*log(c) + (b*e*n*r + 4*b*e*n)*x^
4*log(x) - (b*e*n - a*e*r - 4*a*e)*x^4)*x^r)/(r^2 + 8*r + 16)
```

giac [B] time = 0.36, size = 137, normalized size = 2.32

$$\frac{bnrx^4x^re\log(x)}{r^2+8\,r+16}+\frac{1}{4}\,bdnx^4\log(x)+\frac{4\,bnx^4x^re\log(x)}{r^2+8\,r+16}-\frac{1}{16}\,bdnx^4-\frac{bnx^4x^re}{r^2+8\,r+16}+\frac{1}{4}\,bdx^4\log(c)+\frac{bx^4x^re\log(c)}{r+4}+\frac{1}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x^4*x^r*e*log(x)/(r^2 + 8*r + 16) + 1/4*b*d*n*x^4*log(x) + 4*b*n*x^4*
x^r*e*log(x)/(r^2 + 8*r + 16) - 1/16*b*d*n*x^4 - b*n*x^4*x^r*e/(r^2 + 8*r +
 16) + 1/4*b*d*x^4*log(c) + b*x^4*x^r*e*log(c)/(r + 4) + 1/4*a*d*x^4 + a*x^
4*x^r*e/(r + 4)
```

maple [C] time = 0.27, size = 613, normalized size = 10.39

$$\frac{(dr+4e\,x^r+4d)\,b\,x^4\ln(x^n)}{16+4r}-\frac{\left(16bdn-64ae\,x^r-16aer\,x^r+16ben\,x^r-4bd\,r^2\ln(c)-32bdr\ln(c)-64be\,x^r\ln(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+e*x^r)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/4*b*x^4*(d*r+4*e*x^r+4*d)/(4+r)*ln(x^n)-1/16*x^4*(16*b*d*n-64*a*e*x^r-16*
a*e*r*x^r+16*b*e*n*x^r-4*b*d*r^2*ln(c)-32*b*d*r*ln(c)-64*b*e*x^r*ln(c)-32*a
*d*r-64*a*d+b*d*n*r^2-4*a*d*r^2+8*b*d*n*r-64*b*d*ln(c)-2*I*Pi*b*d*r^2*csgn(
I*c*x^n)^2*csgn(I*c)-32*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+2*I*Pi*b*d
*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+32*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)*x^r-8*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r-8*I*Pi*b*e*c
sgn(I*c*x^n)^2*csgn(I*c)*x^r*r+32*I*Pi*b*d*csgn(I*c*x^n)^3+8*I*Pi*b*e*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r+16*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*r-32*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+8*I*Pi*b*e*csgn(I*c*x
^n)^3*x^r*r-16*b*e*r*x^r*ln(c)+2*I*Pi*b*d*r^2*csgn(I*c*x^n)^3+32*I*Pi*b*e*c
sgn(I*c*x^n)^3*x^r-32*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)-32*I*Pi*b*d*csgn(I
*x^n)*csgn(I*c*x^n)^2+16*I*Pi*b*d*csgn(I*c*x^n)^3*r-16*I*Pi*b*d*csgn(I*x^n)
*csgn(I*c*x^n)^2*r-16*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*r-2*I*Pi*b*d*r^2*c
sgn(I*x^n)*csgn(I*c*x^n)^2+32*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c))
/(4+r)^2
```

maxima [A] time = 0.99, size = 76, normalized size = 1.29

$$-\frac{1}{16}\,bdnx^4+\frac{1}{4}\,bdx^4\log\left(cx^n\right)+\frac{1}{4}\,adx^4+\frac{bex^{r+4}\log\left(cx^n\right)}{r+4}-\frac{benx^{r+4}}{(r+4)^2}+\frac{aex^{r+4}}{r+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/16*b*d*n*x^4 + 1/4*b*d*x^4*log(c*x^n) + 1/4*a*d*x^4 + b*e*x^(r + 4)*log(
c*x^n)/(r + 4) - b*e*n*x^(r + 4)/(r + 4)^2 + a*e*x^(r + 4)/(r + 4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int x^3\,(d+e\,x^r)\,(a+b\,\ln(c\,x^n))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d + e*x^r)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^3*(d + e*x^r)*(a + b*log(c*x^n)), x)
```

sympy [A] time = 30.32, size = 525, normalized size = 8.90

$$\begin{cases} \frac{4adr^2x^4}{16r^2+128r+256} + \frac{32adrx^4}{16r^2+128r+256} + \frac{64adx^4}{16r^2+128r+256} + \frac{16aerx^4x^r}{16r^2+128r+256} + \frac{64aex^4x^r}{16r^2+128r+256} + \frac{4bdnr^2x^4\log(x)}{16r^2+128r+256} - \frac{bdnr^2x^4}{16r^2+128r+256} + \frac{32bdn}{16r^2+} \\ \frac{adx^4}{4} + ae\log(x) + \frac{bdnx^4\log(x)}{4} - \frac{bdnx^4}{16} + \frac{bdx^4\log(c)}{4} + \frac{ben\log(x)^2}{2} + be\log(c)\log(x) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((4*a*d*r**2*x**4/(16*r**2 + 128*r + 256) + 32*a*d*r*x**4/(16*r**2
 + 128*r + 256) + 64*a*d*x**4/(16*r**2 + 128*r + 256) + 16*a*e*r*x**4*x**r/
(16*r**2 + 128*r + 256) + 64*a*e*x**4*x**r/(16*r**2 + 128*r + 256) + 4*b*d*
n*r**2*x**4*log(x)/(16*r**2 + 128*r + 256) - b*d*n*r**2*x**4/(16*r**2 + 128
*r + 256) + 32*b*d*n*r*x**4*log(x)/(16*r**2 + 128*r + 256) - 8*b*d*n*r*x**4
/(16*r**2 + 128*r + 256) + 64*b*d*n*x**4*log(x)/(16*r**2 + 128*r + 256) - 1
6*b*d*n*x**4/(16*r**2 + 128*r + 256) + 4*b*d*r**2*x**4*log(c)/(16*r**2 + 12
8*r + 256) + 32*b*d*r*x**4*log(c)/(16*r**2 + 128*r + 256) + 64*b*d*x**4*log
(c)/(16*r**2 + 128*r + 256) + 16*b*e*n*r*x**4*x**r*log(x)/(16*r**2 + 128*r
+ 256) + 64*b*e*n*x**4*x**r*log(x)/(16*r**2 + 128*r + 256) - 16*b*e*n*x**4*
x**r/(16*r**2 + 128*r + 256) + 16*b*e*r*x**4*x**r*log(c)/(16*r**2 + 128*r +
 256) + 64*b*e*x**4*x**r*log(c)/(16*r**2 + 128*r + 256), Ne(r, -4)), (a*d*x
**4/4 + a*e*log(x) + b*d*n*x**4*log(x)/4 - b*d*n*x**4/16 + b*d*x**4*log(c)/
4 + b*e*n*log(x)**2/2 + b*e*log(c)*log(x), True))
```

3.369 $\int x\left(d+e x^r\right)\left(a+b \log \left(c x^n\right)\right) dx$

Optimal. Leaf size=59

$$\frac{1}{2}\left(dx^2+\frac{2ex^{r+2}}{r+2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bdnx^2-\frac{benx^{r+2}}{(r+2)^2}$$

```
[Out] -1/4*b*d*n*x^2-b*e*n*x^(2+r)/(2+r)^2+1/2*(d*x^2+2*e*x^(2+r)/(2+r))*(a+b*ln(
c*x^n))
```

Rubi [A] time = 0.06, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {14, 2334, 12}

$$\frac{1}{2}\left(dx^2+\frac{2ex^{r+2}}{r+2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bdnx^2-\frac{benx^{r+2}}{(r+2)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^2)/4 - (b*e*n*x^(2 + r))/(2 + r)^2 + ((d*x^2 + (2*e*x^(2 + r))/(2
 + r))*(a + b*Log[c*x^n]))/2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int x\left(d+ex^r\right)\left(a+b\log\left(cx^n\right)\right) dx &= \frac{1}{2}\left(dx^2+\frac{2ex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{1}{2}x\left(d+\frac{2ex^r}{2+r}\right) dx\\
&= \frac{1}{2}\left(dx^2+\frac{2ex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int x\left(d+\frac{2ex^r}{2+r}\right) dx\\
&= \frac{1}{2}\left(dx^2+\frac{2ex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int \left(dx+\frac{2ex^{1+r}}{2+r}\right) dx\\
&= -\frac{1}{4}bdnx^2-\frac{benx^{2+r}}{(2+r)^2}+\frac{1}{2}\left(dx^2+\frac{2ex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.09, size = 73, normalized size = 1.24

$$\frac{x^2\left(2a(r+2)\left(d(r+2)+2ex^r\right)+2b(r+2)\log\left(cx^n\right)\left(d(r+2)+2ex^r\right)-bn\left(d(r+2)^2+4ex^r\right)\right)}{4(r+2)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(2*a*(2 + r)*(d*(2 + r) + 2*e*x^r) - b*n*(d*(2 + r)^2 + 4*e*x^r) + 2*b
*(2 + r)*(d*(2 + r) + 2*e*x^r)*Log[c*x^n]))/(4*(2 + r)^2)
```

fricas [B] time = 0.46, size = 159, normalized size = 2.69

$$\frac{2\left(bdr^2+4\,bdr+4\,bd\right)x^2\log(c)+2\left(bdnr^2+4\,bdnr+4\,bdn\right)x^2\log(x)-\left(4\,bdn+(bdn-2\,ad)r^2-8\,ad+4\,(bdn\right.}{4\left(r^2+4\,r+4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*(b*d*r^2 + 4*b*d*r + 4*b*d)*x^2*log(c) + 2*(b*d*n*r^2 + 4*b*d*n*r +
4*b*d*n)*x^2*log(x) - (4*b*d*n + (b*d*n - 2*a*d)*r^2 - 8*a*d + 4*(b*d*n - 2
*a*d)*r)*x^2 + 4*((b*e*r + 2*b*e)*x^2*log(c) + (b*e*n*r + 2*b*e*n)*x^2*log(
x) - (b*e*n - a*e*r - 2*a*e)*x^2)*x^r)/(r^2 + 4*r + 4)
```

giac [B] time = 0.34, size = 137, normalized size = 2.32

$$\frac{bnrx^2x^re\log(x)}{r^2+4\,r+4}+\frac{1}{2}\,bdnx^2\log(x)+\frac{2\,bnx^2x^re\log(x)}{r^2+4\,r+4}-\frac{1}{4}\,bdnx^2-\frac{bnx^2x^re}{r^2+4\,r+4}+\frac{1}{2}\,bdx^2\log(c)+\frac{bx^2x^re\log(c)}{r+2}+\frac{1}{2}\,adx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x^2*x^r*e*log(x)/(r^2 + 4*r + 4) + 1/2*b*d*n*x^2*log(x) + 2*b*n*x^2*x
^r*e*log(x)/(r^2 + 4*r + 4) - 1/4*b*d*n*x^2 - b*n*x^2*x^r*e/(r^2 + 4*r + 4)
 + 1/2*b*d*x^2*log(c) + b*x^2*x^r*e*log(c)/(r + 2) + 1/2*a*d*x^2 + a*x^2*x^
r*e/(r + 2)
```

maple [C] time = 0.26, size = 613, normalized size = 10.39

$$\frac{(dr+2e\,x^r+2d)\,b\,x^2\ln\left(x^n\right)}{4+2r}-\frac{\left(4bdn-8ae\,x^r-4aer\,x^r+4ben\,x^r-2bd\,r^2\ln(c)-8bdr\ln(c)-8be\,x^r\ln(c)-8adr\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+e*x^r)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/2*b*x^2*(d*r+2*e*x^r+2*d)/(2+r)*ln(x^n)-1/4*x^2*(4*b*d*n-8*a*e*x^r-4*a*e*
r*x^r+4*b*e*n*x^r-2*b*d*r^2*ln(c)-8*b*d*r*ln(c)-8*b*e*x^r*ln(c)-8*a*d*r-8*a
*d+b*d*n*r^2-2*a*d*r^2+4*b*d*n*r-8*b*d*ln(c)+4*I*Pi*b*d*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*r+4*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-2*I*P
i*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r-2*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c
)*x^r*r+I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi*b*e*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r+4*I*Pi*b*d*csgn(I*c*x^n)^3+4*I*Pi*b*d*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*r-
4*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*r-4*b*e*r*x^r*ln(c)-4*I*csgn(I*c*x^n)^
2*csgn(I*x^n)*d*b*Pi-4*I*csgn(I*c)*csgn(I*c*x^n)^2*d*b*Pi+4*I*Pi*b*d*csgn(I
*c*x^n)^3*r+4*I*Pi*b*e*csgn(I*c*x^n)^3*x^r+I*Pi*b*d*r^2*csgn(I*c*x^n)^3-4*I
*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2*I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r-I*Pi
*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)
-4*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r)/(2+r)^2
```

maxima [A] time = 1.05, size = 76, normalized size = 1.29

$$-\frac{1}{4}\,bdnx^2+\frac{1}{2}\,bdx^2\log\left(cx^n\right)+\frac{1}{2}\,adx^2+\frac{bex^{r+2}\log\left(cx^n\right)}{r+2}-\frac{benx^{r+2}}{(r+2)^2}+\frac{aex^{r+2}}{r+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/4*b*d*n*x^2 + 1/2*b*d*x^2*log(c*x^n) + 1/2*a*d*x^2 + b*e*x^(r + 2)*log(c
*x^n)/(r + 2) - b*e*n*x^(r + 2)/(r + 2)^2 + a*e*x^(r + 2)/(r + 2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\left(d+e\,x^r\right)\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d + e*x^r)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x*(d + e*x^r)*(a + b*log(c*x^n)), x)
```

sympy [A] time = 5.85, size = 525, normalized size = 8.90

$$\begin{cases} \frac{2adr^2x^2}{4r^2+16r+16} + \frac{8adrx^2}{4r^2+16r+16} + \frac{8adx^2}{4r^2+16r+16} + \frac{4aerx^2x^r}{4r^2+16r+16} + \frac{8aex^2x^r}{4r^2+16r+16} + \frac{2bdnr^2x^2\log(x)}{4r^2+16r+16} - \frac{bdnr^2x^2}{4r^2+16r+16} + \frac{8bdnrx^2\log(x)}{4r^2+16r+16} - \frac{4b}{4r^2+} \\ \frac{adx^2}{2} + ae\log(x) + \frac{bdnx^2\log(x)}{2} - \frac{bdnx^2}{4} + \frac{bdx^2\log(c)}{2} + \frac{ben\log(x)^2}{2} + be\log(c)\log(x) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((2*a*d*r**2*x**2/(4*r**2 + 16*r + 16) + 8*a*d*r*x**2/(4*r**2 + 16
*r + 16) + 8*a*d*x**2/(4*r**2 + 16*r + 16) + 4*a*e*r*x**2*x**r/(4*r**2 + 16
*r + 16) + 8*a*e*x**2*x**r/(4*r**2 + 16*r + 16) + 2*b*d*n*r**2*x**2*log(x)/
(4*r**2 + 16*r + 16) - b*d*n*r**2*x**2/(4*r**2 + 16*r + 16) + 8*b*d*n*r*x**
2*log(x)/(4*r**2 + 16*r + 16) - 4*b*d*n*r*x**2/(4*r**2 + 16*r + 16) + 8*b*d
*n*x**2*log(x)/(4*r**2 + 16*r + 16) - 4*b*d*n*x**2/(4*r**2 + 16*r + 16) + 2
*b*d*r**2*x**2*log(c)/(4*r**2 + 16*r + 16) + 8*b*d*r*x**2*log(c)/(4*r**2 +
16*r + 16) + 8*b*d*x**2*log(c)/(4*r**2 + 16*r + 16) + 4*b*e*n*r*x**2*x**r*l
og(x)/(4*r**2 + 16*r + 16) + 8*b*e*n*x**2*x**r*log(x)/(4*r**2 + 16*r + 16)
- 4*b*e*n*x**2*x**r/(4*r**2 + 16*r + 16) + 4*b*e*r*x**2*x**r*log(c)/(4*r**2
 + 16*r + 16) + 8*b*e*x**2*x**r*log(c)/(4*r**2 + 16*r + 16), Ne(r, -2)), (a
*d*x**2/2 + a*e*log(x) + b*d*n*x**2*log(x)/2 - b*d*n*x**2/4 + b*d*x**2*log(
c)/2 + b*e*n*log(x)**2/2 + b*e*log(c)*log(x), True))
```

3.370 $\int \frac{(d+ex^r)\left(a+b\log(cx^n)\right)}{x}\,dx$

Optimal. Leaf size=53

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{r}-\frac{benx^r}{r^2}$$

```
[Out] -b*e*n*x^r/r^2+e*x^r*(a+b*ln(c*x^n))/r+1/2*d*(a+b*ln(c*x^n))^2/b/n
```

Rubi [A] time = 0.09, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {14, 2351, 2301, 2304}

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{r}-\frac{benx^r}{r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -((b*e*n*x^r)/r^2) + (e*x^r*(a + b*Log[c*x^n]))/r + (d*(a + b*Log[c*x^n])^2
)/(2*b*n)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^r)\left(a+b\log\left(cx^n\right)\right)}{x}\,dx &= \int \left(\frac{d\left(a+b\log\left(cx^n\right)\right)}{x}+ex^{-1+r}\left(a+b\log\left(cx^n\right)\right)\right)dx\\ &= d\int \frac{a+b\log\left(cx^n\right)}{x}\,dx+e\int x^{-1+r}\left(a+b\log\left(cx^n\right)\right)dx\\ &= -\frac{benx^r}{r^2}+\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{r}+\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}\end{aligned}$$

Mathematica [A] time = 0.09, size = 54, normalized size = 1.02

$$\frac{ex^r(ar-bn)}{r^2}+ad\log(x)+\frac{bd\log^2(cx^n)}{2n}+\frac{bex^r\log(cx^n)}{r}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (e*(-(b*n) + a*r)*x^r)/r^2 + a*d*Log[x] + (b*e*x^r*Log[c*x^n])/r + (b*d*Log
[c*x^n]^2)/(2*n)
```

fricas [A] time = 0.43, size = 64, normalized size = 1.21

$$\frac{bdnr^2\log(x)^2+2\left(benr\log(x)+ber\log(c)-ben+aer\right)x^r+2\left(bdr^2\log(c)+adr^2\right)\log(x)}{2r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/2*(b*d*n*r^2*log(x)^2 + 2*(b*e*n*r*log(x) + b*e*r*log(c) - b*e*n + a*e*r)
*x^r + 2*(b*d*r^2*log(c) + a*d*r^2)*log(x))/r^2
```

giac [A] time = 0.38, size = 69, normalized size = 1.30

$$\frac{1}{2}bdn\log(x)^2+\frac{bnx^re\log(x)}{r}+bd\log(c)\log(x)+\frac{bx^re\log(c)}{r}+ad\log(x)-\frac{bnx^re}{r^2}+\frac{ax^re}{r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d*n*log(x)^2 + b*n*x^r*e*log(x)/r + b*d*log(c)*log(x) + b*x^r*e*log(c
)/r + a*d*log(x) - b*n*x^r*e/r^2 + a*x^r*e/r
```

maple [C] time = 0.26, size = 278, normalized size = 5.25

$$-\frac{i\pi bd\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)\ln(x)}{2}+\frac{i\pi bd\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2\ln(x)}{2}+\frac{i\pi bd\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)^2\,\mathrm{l}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] b*(d*r*ln(x)+e*x^r)/r*ln(x^n)+1/2*I*Pi*ln(x)*b*d*csgn(I*x^n)*csgn(I*c*x^n)^
2-1/2*I*csgn(I*c)*csgn(I*c*x^n)*csgn(I*x^n)*d*b*ln(x)*Pi-1/2*I*csgn(I*c*x^n
)^3*d*b*ln(x)*Pi+1/2*I*Pi*ln(x)*b*d*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I/r*Pi*b*
e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1/2*I/r*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*x^r-1/2*I/r*Pi*b*e*csgn(I*c*x^n)^3*x^r+1/2*I/r*Pi*b*e*csgn(I*c*x^
n)^2*csgn(I*c)*x^r-1/2*b*d*n*ln(x)^2+b*d*ln(c)*ln(x)+1/r*b*e*x^r*ln(c)+a*d*
ln(x)+1/r*x^r*a*e-b*e*n*x^r/r^2
```

maxima [A] time = 1.02, size = 56, normalized size = 1.06

$$\frac{bex^r\log(cx^n)}{r}+\frac{bd\log(cx^n)^2}{2n}+ad\log(x)-\frac{benx^r}{r^2}+\frac{aex^r}{r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] b*e*x^r*log(c*x^n)/r + 1/2*b*d*log(c*x^n)^2/n + a*d*log(x) - b*e*n*x^r/r^2
+ a*e*x^r/r
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\left(d+e\,x^r\right)\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)*(a + b*log(c*x^n)))/x,x)
```

```
[Out] int(((d + e*x^r)*(a + b*log(c*x^n)))/x, x)
```

sympy [A] time = 9.86, size = 112, normalized size = 2.11

$$\begin{cases} ad\log(x) + \frac{aex^r}{r} + \frac{bdn\log(x)^2}{2} + bd\log(c)\log(x) + \frac{benx^r\log(x)}{r} - \frac{benx^r}{r^2} + \frac{bex^r\log(c)}{r} & \text{for } r \neq 0 \\ (d+e)\left(\begin{cases} a\log(x) & \text{for } b = 0 \\ -\left(-a - b\log(c)\right)\log(x) & \text{for } n = 0 \\ \frac{\left(-a-b\log(cx^n)\right)^2}{2bn} & \text{otherwise} \end{cases}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Piecewise((a*d*log(x) + a*e*x**r/r + b*d*n*log(x)**2/2 + b*d*log(c)*log(x)
+ b*e*n*x**r*log(x)/r - b*e*n*x**r/r**2 + b*e*x**r*log(c)/r, Ne(r, 0)), ((d
 + e)*Piecewise((a*log(x), Eq(b, 0)), (-(-a - b*log(c))*log(x), Eq(n, 0)),
((-a - b*log(c*x**n))**2/(2*b*n), True)), True))
```

3.371 $\int \frac{(d+ex^r)\left(a+b\log(cx^n)\right)}{x^3}\,dx$

Optimal. Leaf size=71

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{ex^{r-2}\left(a+b\log\left(cx^n\right)\right)}{2-r}-\frac{bdn}{4x^2}-\frac{benx^{r-2}}{(2-r)^2}$$

```
[Out] -1/4*b*d*n/x^2-b*e*n*x^(-2+r)/(2-r)^2-1/2*d*(a+b*ln(c*x^n))/x^2-e*x^(-2+r)*
(a+b*ln(c*x^n))/(2-r)
```

Rubi [A] time = 0.07, antiderivative size = 63, normalized size of antiderivative = 0.89, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$-\frac{1}{2}\left(\frac{d}{x^2}+\frac{2ex^{r-2}}{2-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{4x^2}-\frac{benx^{r-2}}{(2-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d*n)/(4*x^2) - (b*e*n*x^(-2 + r))/(2 - r)^2 - ((d/x^2 + (2*e*x^(-2 + r)
)/(2 - r))*(a + b*Log[c*x^n]))/2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^r)\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx &= -\frac{1}{2}\left(\frac{d}{x^2}+\frac{2ex^{-2+r}}{2-r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(-\frac{d}{2x^3}+\frac{ex^{-3+r}}{-2+r}\right)dx\\ &= -\frac{bdn}{4x^2}-\frac{benx^{-2+r}}{(2-r)^2}-\frac{1}{2}\left(\frac{d}{x^2}+\frac{2ex^{-2+r}}{2-r}\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.11, size = 72, normalized size = 1.01

$$-\frac{2a(r-2)\left(d(r-2)-2ex^r\right)+2b(r-2)\log\left(cx^n\right)\left(d(r-2)-2ex^r\right)+bn\left(d(r-2)^2+4ex^r\right)}{4(r-2)^2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -1/4*(2*a*(-2 + r)*(d*(-2 + r) - 2*e*x^r) + b*n*(d*(-2 + r)^2 + 4*e*x^r) +
2*b*(-2 + r)*(d*(-2 + r) - 2*e*x^r)*Log[c*x^n])/((-2 + r)^2*x^2)
```

fricas [B] time = 0.46, size = 140, normalized size = 1.97

$$-\frac{4\,bdn + (bdn + 2\,ad)r^2 + 8\,ad - 4\,(bdn + 2\,ad)r + 4\left(ben - aer + 2\,ae - (ber - 2\,be)\log(c) - (benr - 2\,ben)\log(x}{4\left(r^2 - 4\,r + 4\right)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] -1/4*(4*b*d*n + (b*d*n + 2*a*d)*r^2 + 8*a*d - 4*(b*d*n + 2*a*d)*r + 4*(b*e*
n - a*e*r + 2*a*e - (b*e*r - 2*b*e)*log(c) - (b*e*n*r - 2*b*e*n)*log(x))*x^
r + 2*(b*d*r^2 - 4*b*d*r + 4*b*d)*log(c) + 2*(b*d*n*r^2 - 4*b*d*n*r + 4*b*d
*n)*log(x))/((r^2 - 4*r + 4)*x^2)
```

giac [B] time = 0.40, size = 396, normalized size = 5.58

$$-\frac{bdnr^2\log(x)}{2\left(r^2 - 4\,r + 4\right)x^2} + \frac{bnrx^r e\log(x)}{\left(r^2 - 4\,r + 4\right)x^2} - \frac{bdnr^2}{4\left(r^2 - 4\,r + 4\right)x^2} - \frac{bdr^2\log(c)}{2\left(r^2 - 4\,r + 4\right)x^2} + \frac{brx^r e\log(c)}{\left(r^2 - 4\,r + 4\right)x^2} + \frac{2\,bdnr\log(x)}{\left(r^2 - 4\,r + 4\right)x^2} - \cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] -1/2*b*d*n*r^2*log(x)/((r^2 - 4*r + 4)*x^2) + b*n*r*x^r*e*log(x)/((r^2 - 4*
r + 4)*x^2) - 1/4*b*d*n*r^2/((r^2 - 4*r + 4)*x^2) - 1/2*b*d*r^2*log(c)/((r^
2 - 4*r + 4)*x^2) + b*r*x^r*e*log(c)/((r^2 - 4*r + 4)*x^2) + 2*b*d*n*r*log(
x)/((r^2 - 4*r + 4)*x^2) - 2*b*n*x^r*e*log(x)/((r^2 - 4*r + 4)*x^2) + b*d*n
*r/((r^2 - 4*r + 4)*x^2) - 1/2*a*d*r^2/((r^2 - 4*r + 4)*x^2) - b*n*x^r*e/((
r^2 - 4*r + 4)*x^2) + a*r*x^r*e/((r^2 - 4*r + 4)*x^2) + 2*b*d*r*log(c)/((r^
2 - 4*r + 4)*x^2) - 2*b*x^r*e*log(c)/((r^2 - 4*r + 4)*x^2) - 2*b*d*n*log(x)
/((r^2 - 4*r + 4)*x^2) - b*d*n/((r^2 - 4*r + 4)*x^2) + 2*a*d*r/((r^2 - 4*r
+ 4)*x^2) - 2*a*x^r*e/((r^2 - 4*r + 4)*x^2) - 2*b*d*log(c)/((r^2 - 4*r + 4)
*x^2) - 2*a*d/((r^2 - 4*r + 4)*x^2)
```

maple [C] time = 0.23, size = 613, normalized size = 8.63

$$-\frac{(dr - 2e\,x^r - 2d)\,b\ln(x^n)}{2\,(r-2)\,x^2} - \frac{4bdn + 8ae\,x^r - 4aer\,x^r + 4ben\,x^r + 2bd\,r^2\ln(c) - 8bdr\ln(c) + 8be\,x^r\ln(c) - 8adr + \cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(b*ln(c*x^n)+a)/x^3,x)
```

```
[Out] -1/2*b*(d*r-2*e*x^r-2*d)/(-2+r)/x^2*ln(x^n)-1/4*(4*b*d*n+8*a*e*x^r-4*a*e*r*
x^r+4*b*e*n*x^r+2*b*d*r^2*ln(c)-8*b*d*r*ln(c)+8*b*e*x^r*ln(c)-8*a*d*r+8*a*d
+b*d*n*r^2+2*a*d*r^2-4*b*d*n*r+8*b*d*ln(c)-4*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*x^r-4*I*Pi*b*e*csgn(I*c*x^n)^3*x^r+4*I*Pi*b*d*csgn(I*c*x^n)^
2*csgn(I*c)-I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*I*Pi*b*d*r*c
sgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-2*I*Pi*b*e*r*x^r*csgn(I*x^n)*csgn(I*c*x^
n)^2-2*I*Pi*b*e*r*x^r*csgn(I*c)*csgn(I*c*x^n)^2+2*I*Pi*b*e*r*x^r*csgn(I*c)*
csgn(I*x^n)*csgn(I*c*x^n)-4*I*Pi*b*d*csgn(I*c*x^n)^3-4*I*Pi*b*d*r*csgn(I*x^
n)*csgn(I*c*x^n)^2-4*I*Pi*b*d*r*csgn(I*c)*csgn(I*c*x^n)^2-4*b*e*r*x^r*ln(c)
+I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n
)^2-I*Pi*b*d*r^2*csgn(I*c*x^n)^3-4*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+4*I*Pi*b*d*r*csgn(I*c*x^n)^3+
4*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2*I*Pi*b*e*r*x^r*csgn(I*c*x^n)^3+4
*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r)/(-2+r)^2/x^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-3>0)', see `assume?` for more det
ails)Is r-3 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d + e\,x^r)\,\left(a + b\,\ln\left(c\,x^n\right)\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)*(a + b*log(c*x^n)))/x^3,x)
```

```
[Out] int(((d + e*x^r)*(a + b*log(c*x^n)))/x^3, x)
```

sympy [A] time = 8.94, size = 644, normalized size = 9.07

$$\begin{cases} -\frac{2adr^2}{4r^2x^2-16rx^2+16x^2} + \frac{8adr}{4r^2x^2-16rx^2+16x^2} - \frac{8ad}{4r^2x^2-16rx^2+16x^2} + \frac{4aerx^r}{4r^2x^2-16rx^2+16x^2} - \frac{8aex^r}{4r^2x^2-16rx^2+16x^2} - \frac{2bdnr^2\log(x)}{4r^2x^2-16rx^2+16x^2} - \cdots \\ -\frac{ad}{2x^2} + ae\log(x) + bd\left(-\frac{n}{4x^2} - \frac{\log(cx^n)}{2x^2}\right) - be\left(\begin{cases} -\log(c)\log(x) & \text{for } n=0 \\ -\frac{\log(cx^n)^2}{2n} & \text{otherwise} \end{cases}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] Piecewise((-2*a*d*r**2/(4*r**2*x**2 - 16*r*x**2 + 16*x**2) + 8*a*d*r/(4*r**
2*x**2 - 16*r*x**2 + 16*x**2) - 8*a*d/(4*r**2*x**2 - 16*r*x**2 + 16*x**2) +
 4*a*e*r*x**r/(4*r**2*x**2 - 16*r*x**2 + 16*x**2) - 8*a*e*x**r/(4*r**2*x**2
 - 16*r*x**2 + 16*x**2) - 2*b*d*n*r**2*log(x)/(4*r**2*x**2 - 16*r*x**2 + 16
*x**2) - b*d*n*r**2/(4*r**2*x**2 - 16*r*x**2 + 16*x**2) + 8*b*d*n*r*log(x)/
(4*r**2*x**2 - 16*r*x**2 + 16*x**2) + 4*b*d*n*r/(4*r**2*x**2 - 16*r*x**2 +
16*x**2) - 8*b*d*n*log(x)/(4*r**2*x**2 - 16*r*x**2 + 16*x**2) - 4*b*d*n/(4*
r**2*x**2 - 16*r*x**2 + 16*x**2) - 2*b*d*r**2*log(c)/(4*r**2*x**2 - 16*r*x*
*2 + 16*x**2) + 8*b*d*r*log(c)/(4*r**2*x**2 - 16*r*x**2 + 16*x**2) - 8*b*d*
log(c)/(4*r**2*x**2 - 16*r*x**2 + 16*x**2) + 4*b*e*n*r*x**r*log(x)/(4*r**2*
x**2 - 16*r*x**2 + 16*x**2) - 8*b*e*n*x**r*log(x)/(4*r**2*x**2 - 16*r*x**2
+ 16*x**2) - 4*b*e*n*x**r/(4*r**2*x**2 - 16*r*x**2 + 16*x**2) + 4*b*e*r*x**
r*log(c)/(4*r**2*x**2 - 16*r*x**2 + 16*x**2) - 8*b*e*x**r*log(c)/(4*r**2*x*
*2 - 16*r*x**2 + 16*x**2), Ne(r, 2)), (-a*d/(2*x**2) + a*e*log(x) + b*d*(-n
/(4*x**2) - log(c*x**n)/(2*x**2)) - b*e*Piecewise((-log(c)*log(x), Eq(n, 0)
), (-log(c*x**n)**2/(2*n), True)), True))
```

3.372 $\int \frac{(d+ex^r)\left(a+b\log(cx^n)\right)}{x^5}\,dx$

Optimal. Leaf size=71

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{ex^{r-4}\left(a+b\log\left(cx^n\right)\right)}{4-r}-\frac{bdn}{16x^4}-\frac{benx^{r-4}}{(4-r)^2}$$

```
[Out] -1/16*b*d*n/x^4-b*e*n*x^(-4+r)/(4-r)^2-1/4*d*(a+b*ln(c*x^n))/x^4-e*x^(-4+r)
*(a+b*ln(c*x^n))/(4-r)
```

Rubi [A] time = 0.07, antiderivative size = 63, normalized size of antiderivative = 0.89, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$-\frac{1}{4}\left(\frac{d}{x^4}+\frac{4ex^{r-4}}{4-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{16x^4}-\frac{benx^{r-4}}{(4-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d*n)/(16*x^4) - (b*e*n*x^(-4 + r))/(4 - r)^2 - ((d/x^4 + (4*e*x^(-4 + r
))/(4 - r))*(a + b*Log[c*x^n]))/4
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^r)\left(a+b\log\left(cx^n\right)\right)}{x^5}\,dx &= -\frac{1}{4}\left(\frac{d}{x^4}+\frac{4ex^{-4+r}}{4-r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(-\frac{d}{4x^5}+\frac{ex^{-5+r}}{-4+r}\right)dx\\ &= -\frac{bdn}{16x^4}-\frac{benx^{-4+r}}{(4-r)^2}-\frac{1}{4}\left(\frac{d}{x^4}+\frac{4ex^{-4+r}}{4-r}\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.12, size = 72, normalized size = 1.01

$$-\frac{4a(r-4)\left(d(r-4)-4ex^r\right)+4b(r-4)\log\left(cx^n\right)\left(d(r-4)-4ex^r\right)+bn\left(d(r-4)^2+16ex^r\right)}{16(r-4)^2x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -1/16*(4*a*(-4 + r)*(d*(-4 + r) - 4*e*x^r) + b*n*(d*(-4 + r)^2 + 16*e*x^r)
+ 4*b*(-4 + r)*(d*(-4 + r) - 4*e*x^r)*Log[c*x^n])/((-4 + r)^2*x^4)
```

fricas [B] time = 0.49, size = 140, normalized size = 1.97

$$-\frac{16\,bdn + (bdn + 4\,ad)r^2 + 64\,ad - 8\,(bdn + 4\,ad)r + 16\,\left(ben - aer + 4\,ae - (ber - 4\,be)\log(c) - (benr - 4\,ben$$
$$16\,\left(r^2 - 8\,r + 16\right)x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] -1/16*(16*b*d*n + (b*d*n + 4*a*d)*r^2 + 64*a*d - 8*(b*d*n + 4*a*d)*r + 16*(
b*e*n - a*e*r + 4*a*e - (b*e*r - 4*b*e)*log(c) - (b*e*n*r - 4*b*e*n)*log(x)
)*x^r + 4*(b*d*r^2 - 8*b*d*r + 16*b*d)*log(c) + 4*(b*d*n*r^2 - 8*b*d*n*r +
16*b*d*n)*log(x))/((r^2 - 8*r + 16)*x^4)
```

giac [B] time = 0.51, size = 397, normalized size = 5.59

$$-\frac{bdnr^2\log(x)}{4\left(r^2 - 8\,r + 16\right)x^4} + \frac{bnrx^r e\log(x)}{\left(r^2 - 8\,r + 16\right)x^4} - \frac{bdnr^2}{16\left(r^2 - 8\,r + 16\right)x^4} - \frac{bdr^2\log(c)}{4\left(r^2 - 8\,r + 16\right)x^4} + \frac{brx^r e\log(c)}{\left(r^2 - 8\,r + 16\right)x^4} + \frac{2\,bdnr}{\left(r^2 - 8\,r\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] -1/4*b*d*n*r^2*log(x)/((r^2 - 8*r + 16)*x^4) + b*n*r*x^r*e*log(x)/((r^2 - 8
*r + 16)*x^4) - 1/16*b*d*n*r^2/((r^2 - 8*r + 16)*x^4) - 1/4*b*d*r^2*log(c)/
((r^2 - 8*r + 16)*x^4) + b*r*x^r*e*log(c)/((r^2 - 8*r + 16)*x^4) + 2*b*d*n*
r*log(x)/((r^2 - 8*r + 16)*x^4) - 4*b*n*x^r*e*log(x)/((r^2 - 8*r + 16)*x^4)
 + 1/2*b*d*n*r/((r^2 - 8*r + 16)*x^4) - 1/4*a*d*r^2/((r^2 - 8*r + 16)*x^4)
- b*n*x^r*e/((r^2 - 8*r + 16)*x^4) + a*r*x^r*e/((r^2 - 8*r + 16)*x^4) + 2*b
*d*r*log(c)/((r^2 - 8*r + 16)*x^4) - 4*b*x^r*e*log(c)/((r^2 - 8*r + 16)*x^4
) - 4*b*d*n*log(x)/((r^2 - 8*r + 16)*x^4) - b*d*n/((r^2 - 8*r + 16)*x^4) +
2*a*d*r/((r^2 - 8*r + 16)*x^4) - 4*a*x^r*e/((r^2 - 8*r + 16)*x^4) - 4*b*d*l
og(c)/((r^2 - 8*r + 16)*x^4) - 4*a*d/((r^2 - 8*r + 16)*x^4)
```

maple [C] time = 0.24, size = 613, normalized size = 8.63

$$-\frac{(dr - 4e\,x^r - 4d)\,b\ln(x^n)}{4\,(r-4)\,x^4} - \frac{16bdn + 64ae\,x^r - 16aer\,x^r + 16ben\,x^r + 4bd\,r^2\ln(c) - 32bdr\ln(c) + 64be\,x^r\ln(c)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(b*ln(c*x^n)+a)/x^5,x)
```

```
[Out] -1/4*b*(d*r-4*e*x^r-4*d)/(-4+r)/x^4*ln(x^n)-1/16*(16*b*d*n+64*a*e*x^r-16*a*
e*r*x^r+16*b*e*n*x^r+4*b*d*r^2*ln(c)-32*b*d*r*ln(c)+64*b*e*x^r*ln(c)-32*a*d
*r+64*a*d+b*d*n*r^2+8*I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r+4*a*d*r^2-8*b*d*n*r+64
*b*d*ln(c)+8*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r-32*I*Pi*b*d
*csgn(I*c*x^n)^3+32*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*d*r^2*csg
n(I*c*x^n)^3-32*I*Pi*b*e*csgn(I*c*x^n)^3*x^r-16*b*e*r*x^r*ln(c)-8*I*Pi*b*e*
csgn(I*c*x^n)^2*csgn(I*c)*x^r*r+16*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*r-8*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r-2*I*Pi*b*d*r^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-32*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*x^r+32*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+16*I*Pi*b*d*csgn(I*c*x^n)^3*r-32
*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi*b*d*r^2*csgn(I*c*x^n)^
2*csgn(I*c)-16*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*r-16*I*Pi*b*d*csgn(I*c*
x^n)^2*csgn(I*c)*r+32*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+32*I*Pi*b*e*cs
gn(I*x^n)*csgn(I*c*x^n)^2*x^r+2*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2)/(
-4+r)^2/x^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-5>0)', see `assume?` for more det
ails)Is r-5 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^r)\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)*(a + b*log(c*x^n)))/x^5,x)
```

```
[Out] int(((d + e*x^r)*(a + b*log(c*x^n)))/x^5, x)
```

sympy [A] time = 27.56, size = 644, normalized size = 9.07

$$\begin{cases} -\frac{4adr^2}{16r^2x^4-128rx^4+256x^4}+\frac{32adr}{16r^2x^4-128rx^4+256x^4}-\frac{64ad}{16r^2x^4-128rx^4+256x^4}+\frac{16aerx^r}{16r^2x^4-128rx^4+256x^4}-\frac{64aex^r}{16r^2x^4-128rx^4+256x^4}-\frac{4bdnr^2}{16r^2x^4-128} \\ -\frac{ad}{4x^4}+ae\log(x)+bd\left(-\frac{n}{16x^4}-\frac{\log(cx^n)}{4x^4}\right)-be\left(\begin{cases}-\log(c)\log(x) & \text{for } n=0\\ -\frac{\log(cx^n)^2}{2n} & \text{otherwise}\end{cases}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] Piecewise((-4*a*d*r**2/(16*r**2*x**4 - 128*r*x**4 + 256*x**4) + 32*a*d*r/(1
6*r**2*x**4 - 128*r*x**4 + 256*x**4) - 64*a*d/(16*r**2*x**4 - 128*r*x**4 +
256*x**4) + 16*a*e*r*x**r/(16*r**2*x**4 - 128*r*x**4 + 256*x**4) - 64*a*e*x
**r/(16*r**2*x**4 - 128*r*x**4 + 256*x**4) - 4*b*d*n*r**2*log(x)/(16*r**2*x
**4 - 128*r*x**4 + 256*x**4) - b*d*n*r**2/(16*r**2*x**4 - 128*r*x**4 + 256*
x**4) + 32*b*d*n*r*log(x)/(16*r**2*x**4 - 128*r*x**4 + 256*x**4) + 8*b*d*n*
r/(16*r**2*x**4 - 128*r*x**4 + 256*x**4) - 64*b*d*n*log(x)/(16*r**2*x**4 -
128*r*x**4 + 256*x**4) - 16*b*d*n/(16*r**2*x**4 - 128*r*x**4 + 256*x**4) -
4*b*d*r**2*log(c)/(16*r**2*x**4 - 128*r*x**4 + 256*x**4) + 32*b*d*r*log(c)/
(16*r**2*x**4 - 128*r*x**4 + 256*x**4) - 64*b*d*log(c)/(16*r**2*x**4 - 128*
r*x**4 + 256*x**4) + 16*b*e*n*r*x**r*log(x)/(16*r**2*x**4 - 128*r*x**4 + 25
6*x**4) - 64*b*e*n*x**r*log(x)/(16*r**2*x**4 - 128*r*x**4 + 256*x**4) - 16*
b*e*n*x**r/(16*r**2*x**4 - 128*r*x**4 + 256*x**4) + 16*b*e*r*x**r*log(c)/(1
6*r**2*x**4 - 128*r*x**4 + 256*x**4) - 64*b*e*x**r*log(c)/(16*r**2*x**4 - 1
28*r*x**4 + 256*x**4), Ne(r, 4)), (-a*d/(4*x**4) + a*e*log(x) + b*d*(-n/(16
*x**4) - log(c*x**n)/(4*x**4)) - b*e*Piecewise((-log(c)*log(x), Eq(n, 0)),
(-log(c*x**n)**2/(2*n), True)), True))
```

3.373 $\int x^4 (d+ex^r) \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=59

$$\frac{1}{5}\left(dx^5+\frac{5ex^{r+5}}{r+5}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bdnx^5-\frac{benx^{r+5}}{(r+5)^2}$$

```
[Out] -1/25*b*d*n*x^5-b*e*n*x^(5+r)/(5+r)^2+1/5*(d*x^5+5*e*x^(5+r)/(5+r))*(a+b*ln
(c*x^n))
```

Rubi [A] time = 0.08, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$\frac{1}{5}\left(dx^5+\frac{5ex^{r+5}}{r+5}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bdnx^5-\frac{benx^{r+5}}{(r+5)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^5)/25 - (b*e*n*x^(5 + r))/(5 + r)^2 + ((d*x^5 + (5*e*x^(5 + r))/(
5 + r))*(a + b*Log[c*x^n]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int x^4 (d+ex^r)\left(a+b\log\left(cx^n\right)\right) dx &= \frac{1}{5}\left(dx^5+\frac{5ex^{5+r}}{5+r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{1}{5}x^4\left(d+\frac{5ex^r}{5+r}\right) dx\\
&= \frac{1}{5}\left(dx^5+\frac{5ex^{5+r}}{5+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{5}(bn)\int x^4\left(d+\frac{5ex^r}{5+r}\right) dx\\
&= \frac{1}{5}\left(dx^5+\frac{5ex^{5+r}}{5+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{5}(bn)\int \left(dx^4+\frac{5ex^{4+r}}{5+r}\right) dx\\
&= -\frac{1}{25}bdnx^5-\frac{benx^{5+r}}{(5+r)^2}+\frac{1}{5}\left(dx^5+\frac{5ex^{5+r}}{5+r}\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.09, size = 73, normalized size = 1.24

$$\frac{x^5\left(5a(r+5)(d(r+5)+5ex^r)+5b(r+5)\log\left(cx^n\right)(d(r+5)+5ex^r)-bn\left(d(r+5)^2+25ex^r\right)\right)}{25(r+5)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^5*(5*a*(5 + r)*(d*(5 + r) + 5*e*x^r) - b*n*(d*(5 + r)^2 + 25*e*x^r) + 5*
b*(5 + r)*(d*(5 + r) + 5*e*x^r)*Log[c*x^n]))/(25*(5 + r)^2)
```

fricas [B] time = 0.43, size = 159, normalized size = 2.69

$$\frac{5\left(bdr^2+10\,bdr+25\,bd\right)x^5\log(c)+5\left(bdnr^2+10\,bdnr+25\,bdn\right)x^5\log(x)-\left(25\,bdn+(bdn-5\,ad)r^2-125\,ad+\right.}{25\left(r^2+10\,r+2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/25*(5*(b*d*r^2 + 10*b*d*r + 25*b*d)*x^5*log(c) + 5*(b*d*n*r^2 + 10*b*d*n*
r + 25*b*d*n)*x^5*log(x) - (25*b*d*n + (b*d*n - 5*a*d)*r^2 - 125*a*d + 10*(
b*d*n - 5*a*d)*r)*x^5 + 25*((b*e*r + 5*b*e)*x^5*log(c) + (b*e*n*r + 5*b*e*n
)*x^5*log(x) - (b*e*n - a*e*r - 5*a*e)*x^5)*x^r)/(r^2 + 10*r + 25)
```

giac [B] time = 0.41, size = 137, normalized size = 2.32

$$\frac{bnrx^5x^re\log(x)}{r^2+10\,r+25}+\frac{1}{5}\,bdnx^5\log(x)+\frac{5\,bnx^5x^re\log(x)}{r^2+10\,r+25}-\frac{1}{25}\,bdnx^5-\frac{bnx^5x^re}{r^2+10\,r+25}+\frac{1}{5}\,bdx^5\log(c)+\frac{bx^5x^re\log(c)}{r+5}+\frac{1}{5}\,a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x^5*x^r*e*log(x)/(r^2 + 10*r + 25) + 1/5*b*d*n*x^5*log(x) + 5*b*n*x^5
*x^r*e*log(x)/(r^2 + 10*r + 25) - 1/25*b*d*n*x^5 - b*n*x^5*x^r*e/(r^2 + 10*
r + 25) + 1/5*b*d*x^5*log(c) + b*x^5*x^r*e*log(c)/(r + 5) + 1/5*a*d*x^5 + a
*x^5*x^r*e/(r + 5)
```

maple [C] time = 0.27, size = 614, normalized size = 10.41

$$\frac{(dr+5e\,x^r+5d)\,b\,x^5\ln\left(x^n\right)}{5r+25}-\frac{\left(50bdn-250ae\,x^r-50aer\,x^r+50ben\,x^r-10bd\,r^2\ln(c)-100bdr\ln(c)-250be\,x^r\ln\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d+e*x^r)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/5*x^5*b*(d*r+5*e*x^r+5*d)/(5+r)*ln(x^n)-1/50*x^5*(50*b*d*n-250*a*e*x^r+12
5*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-50*a*e*r*x^r+50*b*e*n*x^
r-10*b*d*r^2*ln(c)-100*b*d*r*ln(c)-250*b*e*x^r*ln(c)-100*a*d*r-250*a*d+2*b*
d*n*r^2-10*a*d*r^2+20*b*d*n*r-250*b*d*ln(c)+25*I*Pi*b*e*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*x^r*r+125*I*Pi*b*e*csgn(I*c*x^n)^3*x^r-125*I*Pi*b*d*csgn(I
*c*x^n)^2*csgn(I*c)-25*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r-25*I*Pi*b
*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r+50*I*Pi*b*d*r*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)-125*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-125*I*Pi*b*e*csgn(I*x^
n)*csgn(I*c*x^n)^2*x^r-125*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+50*I*Pi*b*d
*csgn(I*c*x^n)^3*r+5*I*Pi*b*d*r^2*csgn(I*c*x^n)^3-50*b*e*r*x^r*ln(c)+5*I*Pi
*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+125*I*Pi*b*d*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)-5*I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)+125*I*Pi*b*d*cs
gn(I*c*x^n)^3-50*I*Pi*b*d*r*csgn(I*c*x^n)^2*csgn(I*c)-50*I*Pi*b*d*csgn(I*x^
n)*csgn(I*c*x^n)^2*r-5*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+25*I*Pi*b*e
*csgn(I*c*x^n)^3*x^r*r)/(5+r)^2
```

maxima [A] time = 1.12, size = 76, normalized size = 1.29

$$-\frac{1}{25}\,bdnx^5+\frac{1}{5}\,bdx^5\log\left(cx^n\right)+\frac{1}{5}\,adx^5+\frac{bex^{r+5}\log\left(cx^n\right)}{r+5}-\frac{benx^{r+5}}{(r+5)^2}+\frac{aex^{r+5}}{r+5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/25*b*d*n*x^5 + 1/5*b*d*x^5*log(c*x^n) + 1/5*a*d*x^5 + b*e*x^(r + 5)*log(
c*x^n)/(r + 5) - b*e*n*x^(r + 5)/(r + 5)^2 + a*e*x^(r + 5)/(r + 5)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int x^4\ (d+e\,x^r)\ (a+b\,\ln(c\,x^n))\ dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d + e*x^r)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^4*(d + e*x^r)*(a + b*log(c*x^n)), x)
```

sympy [A] time = 69.73, size = 525, normalized size = 8.90

$$\begin{cases} \frac{5adr^2x^5}{25r^2+250r+625} + \frac{50adrx^5}{25r^2+250r+625} + \frac{125adx^5}{25r^2+250r+625} + \frac{25aerx^5x^r}{25r^2+250r+625} + \frac{125aex^5x^r}{25r^2+250r+625} + \frac{5bdnr^2x^5\log(x)}{25r^2+250r+625} - \frac{bdnr^2x^5}{25r^2+250r+625} + \frac{50}{25} \\ \frac{adx^5}{5} + ae\log(x) + \frac{bdnx^5\log(x)}{5} - \frac{bdnx^5}{25} + \frac{bdx^5\log(c)}{5} + \frac{ben\log(x)^2}{2} + be\log(c)\log(x) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((5*a*d*r**2*x**5/(25*r**2 + 250*r + 625) + 50*a*d*r*x**5/(25*r**2
 + 250*r + 625) + 125*a*d*x**5/(25*r**2 + 250*r + 625) + 25*a*e*r*x**5*x**r
/(25*r**2 + 250*r + 625) + 125*a*e*x**5*x**r/(25*r**2 + 250*r + 625) + 5*b*
d*n*r**2*x**5*log(x)/(25*r**2 + 250*r + 625) - b*d*n*r**2*x**5/(25*r**2 + 2
50*r + 625) + 50*b*d*n*r*x**5*log(x)/(25*r**2 + 250*r + 625) - 10*b*d*n*r*x
**5/(25*r**2 + 250*r + 625) + 125*b*d*n*x**5*log(x)/(25*r**2 + 250*r + 625)
 - 25*b*d*n*x**5/(25*r**2 + 250*r + 625) + 5*b*d*r**2*x**5*log(c)/(25*r**2
+ 250*r + 625) + 50*b*d*r*x**5*log(c)/(25*r**2 + 250*r + 625) + 125*b*d*x**
5*log(c)/(25*r**2 + 250*r + 625) + 25*b*e*n*r*x**5*x**r*log(x)/(25*r**2 + 2
50*r + 625) + 125*b*e*n*x**5*x**r*log(x)/(25*r**2 + 250*r + 625) - 25*b*e*n
*x**5*x**r/(25*r**2 + 250*r + 625) + 25*b*e*r*x**5*x**r*log(c)/(25*r**2 + 2
50*r + 625) + 125*b*e*x**5*x**r*log(c)/(25*r**2 + 250*r + 625), Ne(r, -5)),
 (a*d*x**5/5 + a*e*log(x) + b*d*n*x**5*log(x)/5 - b*d*n*x**5/25 + b*d*x**5*
log(c)/5 + b*e*n*log(x)**2/2 + b*e*log(c)*log(x), True))
```

3.374 $\int x^2 (d + ex^r) (a + b \log(cx^n)) \, dx$

Optimal. Leaf size=59

$$\frac{1}{3}\left(dx^3 + \frac{3ex^{r+3}}{r+3}\right)\left(a + b\log\left(cx^n\right)\right) - \frac{1}{9}bdnx^3 - \frac{benx^{r+3}}{(r+3)^2}$$

```
[Out] -1/9*b*d*n*x^3-b*e*n*x^(3+r)/(3+r)^2+1/3*(d*x^3+3*e*x^(3+r)/(3+r))*(a+b*ln(
c*x^n))
```

Rubi [A] time = 0.08, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$\frac{1}{3}\left(dx^3 + \frac{3ex^{r+3}}{r+3}\right)\left(a + b\log\left(cx^n\right)\right) - \frac{1}{9}bdnx^3 - \frac{benx^{r+3}}{(r+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^3)/9 - (b*e*n*x^(3 + r))/(3 + r)^2 + ((d*x^3 + (3*e*x^(3 + r))/(3
 + r))*(a + b*Log[c*x^n]))/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int x^2 (d + ex^r)\left(a + b\log\left(cx^n\right)\right) dx &= \frac{1}{3}\left(dx^3 + \frac{3ex^{3+r}}{3+r}\right)\left(a + b\log\left(cx^n\right)\right) - (bn)\int \frac{1}{3}x^2\left(d + \frac{3ex^r}{3+r}\right) dx \\
&= \frac{1}{3}\left(dx^3 + \frac{3ex^{3+r}}{3+r}\right)\left(a + b\log\left(cx^n\right)\right) - \frac{1}{3}(bn)\int x^2\left(d + \frac{3ex^r}{3+r}\right) dx \\
&= \frac{1}{3}\left(dx^3 + \frac{3ex^{3+r}}{3+r}\right)\left(a + b\log\left(cx^n\right)\right) - \frac{1}{3}(bn)\int \left(dx^2 + \frac{3ex^{2+r}}{3+r}\right) dx \\
&= -\frac{1}{9}bdnx^3 - \frac{benx^{3+r}}{(3+r)^2} + \frac{1}{3}\left(dx^3 + \frac{3ex^{3+r}}{3+r}\right)\left(a + b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.10, size = 73, normalized size = 1.24

$$\frac{x^3\left(3a(r+3)\left(d(r+3)+3ex^r\right)+3b(r+3)\log\left(cx^n\right)\left(d(r+3)+3ex^r\right)-bn\left(d(r+3)^2+9ex^r\right)\right)}{9(r+3)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^3*(3*a*(3 + r)*(d*(3 + r) + 3*e*x^r) - b*n*(d*(3 + r)^2 + 9*e*x^r) + 3*b
*(3 + r)*(d*(3 + r) + 3*e*x^r)*Log[c*x^n]))/(9*(3 + r)^2)
```

fricas [B] time = 0.47, size = 159, normalized size = 2.69

$$\frac{3\left(bdr^2+6\,bdr+9\,bd\right)x^3\log(c)+3\left(bdnr^2+6\,bdnr+9\,bdn\right)x^3\log(x)-\left(9\,bdn+(bdn-3\,ad)r^2-27\,ad+6(\cdots\right.}{9\left(r^2+6\,r+9\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/9*(3*(b*d*r^2 + 6*b*d*r + 9*b*d)*x^3*log(c) + 3*(b*d*n*r^2 + 6*b*d*n*r +
9*b*d*n)*x^3*log(x) - (9*b*d*n + (b*d*n - 3*a*d)*r^2 - 27*a*d + 6*(b*d*n -
3*a*d)*r)*x^3 + 9*((b*e*r + 3*b*e)*x^3*log(c) + (b*e*n*r + 3*b*e*n)*x^3*log
(x) - (b*e*n - a*e*r - 3*a*e)*x^3)*x^r)/(r^2 + 6*r + 9)
```

giac [B] time = 0.37, size = 137, normalized size = 2.32

$$\frac{bnrx^3x^re\log(x)}{r^2+6\,r+9}+\frac{1}{3}\,bdnx^3\log(x)+\frac{3\,bnx^3x^re\log(x)}{r^2+6\,r+9}-\frac{1}{9}\,bdnx^3-\frac{bnx^3x^re}{r^2+6\,r+9}+\frac{1}{3}\,bdx^3\log(c)+\frac{bx^3x^re\log(c)}{r+3}+\frac{1}{3}\,a\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x^3*x^r*e*log(x)/(r^2 + 6*r + 9) + 1/3*b*d*n*x^3*log(x) + 3*b*n*x^3*x
^r*e*log(x)/(r^2 + 6*r + 9) - 1/9*b*d*n*x^3 - b*n*x^3*x^r*e/(r^2 + 6*r + 9)
 + 1/3*b*d*x^3*log(c) + b*x^3*x^r*e*log(c)/(r + 3) + 1/3*a*d*x^3 + a*x^3*x^
r*e/(r + 3)
```

maple [C] time = 0.27, size = 614, normalized size = 10.41

$$\frac{(dr+3e\,x^r+3d)\,b\,x^3\ln\left(x^n\right)}{3r+9}-\frac{\left(18bdn-54ae\,x^r-18aer\,x^r+18ben\,x^r-6bd\,r^2\ln(c)-36bdr\ln(c)-54be\,x^r\ln(\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+e*x^r)*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/3*b*x^3*(d*r+3*e*x^r+3*d)/(3+r)*ln(x^n)-1/18*x^3*(18*b*d*n-54*a*e*x^r-18*
a*e*r*x^r+18*b*e*n*x^r-6*b*d*r^2*ln(c)-36*b*d*r*ln(c)-54*b*e*x^r*ln(c)-36*a
*d*r-54*a*d+2*b*d*n*r^2-6*a*d*r^2+12*b*d*n*r-54*b*d*ln(c)-18*I*Pi*b*d*r*csg
n(I*c*x^n)^2*csgn(I*c)+27*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-27*I
*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-3*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x
^n)^2-27*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b*d*r^2*csgn(I*c)*csgn(I
*c*x^n)^2-18*b*e*r*x^r*ln(c)-9*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r-9
*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r+27*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*x^r+3*I*Pi*b*d*r^2*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+18*I*
Pi*b*d*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+27*I*Pi*b*d*csgn(I*c*x^n)^3+9*
I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r-27*I*Pi*b*e*csgn(I*x^n)*
csgn(I*c*x^n)^2*x^r-18*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*r+9*I*Pi*b*e*cs
gn(I*c*x^n)^3*x^r*r+3*I*Pi*b*d*r^2*csgn(I*c*x^n)^3-27*I*Pi*b*d*csgn(I*x^n)*
csgn(I*c*x^n)^2+18*I*Pi*b*d*csgn(I*c*x^n)^3*r+27*I*Pi*b*e*csgn(I*c*x^n)^3*x
^r)/(3+r)^2
```

maxima [A] time = 1.00, size = 76, normalized size = 1.29

$$-\frac{1}{9}\,bdnx^3+\frac{1}{3}\,bdx^3\log\left(cx^n\right)+\frac{1}{3}\,adx^3+\frac{bex^{r+3}\log\left(cx^n\right)}{r+3}-\frac{benx^{r+3}}{(r+3)^2}+\frac{aex^{r+3}}{r+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/9*b*d*n*x^3 + 1/3*b*d*x^3*log(c*x^n) + 1/3*a*d*x^3 + b*e*x^(r + 3)*log(c
*x^n)/(r + 3) - b*e*n*x^(r + 3)/(r + 3)^2 + a*e*x^(r + 3)/(r + 3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int x^2\,(d+e\,x^r)\,(a+b\,\ln(c\,x^n))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d + e*x^r)*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^2*(d + e*x^r)*(a + b*log(c*x^n)), x)
```

sympy [A] time = 13.46, size = 525, normalized size = 8.90

$$\begin{cases} \frac{3adr^2x^3}{9r^2+54r+81} + \frac{18adrx^3}{9r^2+54r+81} + \frac{27adx^3}{9r^2+54r+81} + \frac{9aerx^3x^r}{9r^2+54r+81} + \frac{27aex^3x^r}{9r^2+54r+81} + \frac{3bdnr^2x^3\log(x)}{9r^2+54r+81} - \frac{bdnr^2x^3}{9r^2+54r+81} + \frac{18bdnrx^3\log(x)}{9r^2+54r+81} - \frac{6bdn}{9r^2+54} \\ \frac{adx^3}{3} + ae\log(x) + \frac{bdnx^3\log(x)}{3} - \frac{bdnx^3}{9} + \frac{bdx^3\log(c)}{3} + \frac{ben\log(x)^2}{2} + be\log(c)\log(x) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((3*a*d*r**2*x**3/(9*r**2 + 54*r + 81) + 18*a*d*r*x**3/(9*r**2 + 5
4*r + 81) + 27*a*d*x**3/(9*r**2 + 54*r + 81) + 9*a*e*r*x**3*x**r/(9*r**2 +
54*r + 81) + 27*a*e*x**3*x**r/(9*r**2 + 54*r + 81) + 3*b*d*n*r**2*x**3*log(
x)/(9*r**2 + 54*r + 81) - b*d*n*r**2*x**3/(9*r**2 + 54*r + 81) + 18*b*d*n*r
*x**3*log(x)/(9*r**2 + 54*r + 81) - 6*b*d*n*r*x**3/(9*r**2 + 54*r + 81) + 2
7*b*d*n*x**3*log(x)/(9*r**2 + 54*r + 81) - 9*b*d*n*x**3/(9*r**2 + 54*r + 81
) + 3*b*d*r**2*x**3*log(c)/(9*r**2 + 54*r + 81) + 18*b*d*r*x**3*log(c)/(9*r
**2 + 54*r + 81) + 27*b*d*x**3*log(c)/(9*r**2 + 54*r + 81) + 9*b*e*n*r*x**3
*x**r*log(x)/(9*r**2 + 54*r + 81) + 27*b*e*n*x**3*x**r*log(x)/(9*r**2 + 54*
r + 81) - 9*b*e*n*x**3*x**r/(9*r**2 + 54*r + 81) + 9*b*e*r*x**3*x**r*log(c)
/(9*r**2 + 54*r + 81) + 27*b*e*x**3*x**r*log(c)/(9*r**2 + 54*r + 81), Ne(r,
 -3)), (a*d*x**3/3 + a*e*log(x) + b*d*n*x**3*log(x)/3 - b*d*n*x**3/9 + b*d*
x**3*log(c)/3 + b*e*n*log(x)**2/2 + b*e*log(c)*log(x), True))
```

3.375 $\int (d+ex^r) \left(a+b\log\left(cx^n\right)\right) \, dx$

Optimal. Leaf size=57

$$dx\left(a+b\log\left(cx^n\right)\right)+\frac{ex^{r+1}\left(a+b\log\left(cx^n\right)\right)}{r+1}-bdnx-\frac{benx^{r+1}}{(r+1)^2}$$

```
[Out] -b*d*n*x-b*e*n*x^(1+r)/(1+r)^2+d*x*(a+b*ln(c*x^n))+e*x^(1+r)*(a+b*ln(c*x^n)
)/(1+r)
```

Rubi [A] time = 0.03, antiderivative size = 49, normalized size of antiderivative = 0.86, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2313, 12}

$$\left(dx+\frac{ex^{r+1}}{r+1}\right)\left(a+b\log\left(cx^n\right)\right)-bdnx-\frac{benx^{r+1}}{(r+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x) - (b*e*n*x^(1 + r))/(1 + r)^2 + (d*x + (e*x^(1 + r))/(1 + r))*(a
 + b*Log[c*x^n])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\begin{aligned}
\int (d+ex^r)\left(a+b\log\left(cx^n\right)\right)\,dx &= \left(dx+\frac{ex^{1+r}}{1+r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{d+dr+ex^r}{1+r}\,dx\\
&= \left(dx+\frac{ex^{1+r}}{1+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int (d+dr+ex^r)\,dx}{1+r}\\
&= -bdnx-\frac{benx^{1+r}}{(1+r)^2}+\left(dx+\frac{ex^{1+r}}{1+r}\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.13, size = 53, normalized size = 0.93

$$x\left(\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{r+1}+ad+bd\log\left(cx^n\right)-bdn-\frac{benx^r}{(r+1)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(a*d - b*d*n - (b*e*n*x^r)/(1 + r)^2 + b*d*Log[c*x^n] + (e*x^r*(a + b*Log
[c*x^n]))/(1 + r))
```

fricas [B] time = 0.41, size = 138, normalized size = 2.42

$$\frac{\left(bdr^2 + 2\,bdr + bd\right)x\log(c) + \left(bdnr^2 + 2\,bdnr + bdn\right)x\log(x) - \left(bdn + (bdn - ad)r^2 - ad + 2\,(bdn - ad)r\right)x + \left((b\right.}{r^2 + 2\,r + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((b*d*r^2 + 2*b*d*r + b*d)*x*log(c) + (b*d*n*r^2 + 2*b*d*n*r + b*d*n)*x*log
(x) - (b*d*n + (b*d*n - a*d)*r^2 - a*d + 2*(b*d*n - a*d)*r)*x + ((b*e*r + b
*e)*x*x*log(c) + (b*e*n*r + b*e*n)*x*log(x) - (b*e*n - a*e*r - a*e)*x)*x^r)/(
r^2 + 2*r + 1)
```

giac [B] time = 0.39, size = 115, normalized size = 2.02

$$\frac{bnrxx^re\log(x)}{r^2 + 2\,r + 1} + bdnx\log(x) + \frac{bnxx^re\log(x)}{r^2 + 2\,r + 1} - bdnx - \frac{bnxx^re}{r^2 + 2\,r + 1} + bdx\log(c) + \frac{bxx^re\log(c)}{r + 1} + adx + \frac{axx^re}{r + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x*x^r*e*log(x)/(r^2 + 2*r + 1) + b*d*n*x*log(x) + b*n*x*x^r*e*log(x)/
(r^2 + 2*r + 1) - b*d*n*x - b*n*x*x^r*e/(r^2 + 2*r + 1) + b*d*x*log(c) + b*
x*x^r*e*log(c)/(r + 1) + a*d*x + a*x*x^r*e/(r + 1)
```

maple [C] time = 0.27, size = 606, normalized size = 10.63

$$\frac{(dr + e\,x^r + d)\,bx\ln(x^n)}{r + 1} - \frac{\left(2bdn - 2ae\,x^r - 2aer\,x^r + 2ben\,x^r - 2bd\,r^2\ln(c) - 4bdr\ln(c) - 2be\,x^r\ln(c) - 4adr - 2a\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(b*ln(c*x^n)+a),x)
```

```
[Out] b*x*(d*r+e*x^r+d)/(1+r)*ln(x^n)-1/2*x*(2*b*d*n-2*a*e*x^r+I*Pi*b*d*r^2*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*a*e*r*x^r+2*b*e*n*x^r-2*b*d*r^2*ln(c)-4*b*
d*r*ln(c)-2*b*e*x^r*ln(c)-4*a*d*r-2*a*d+2*b*d*n*r^2+I*Pi*b*e*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*x^r*r-2*a*d*r^2+4*b*d*n*r-2*b*d*ln(c)-I*Pi*b*e*csgn(I
*x^n)*csgn(I*c*x^n)^2*x^r*r-I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b
*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d*csgn(I*c*x^n)^3+I*x^r*csgn(I*c)*c
sgn(I*c*x^n)*csgn(I*x^n)*e*b*Pi-I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r+I*
Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*b*e*r*x^r*ln(c)+2*I*Pi*b*d*r*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b*d*r*csgn(I*c*x^n)^2*csgn(I*c)-I
*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi*b*d*csgn(I*c*x^n)^3*r-I*Pi*b*d*c
sgn(I*c*x^n)^2*csgn(I*c)+I*x^r*csgn(I*c*x^n)^3*e*b*Pi+I*Pi*b*d*r^2*csgn(I*c
*x^n)^3-2*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*r-I*x^r*csgn(I*c*x^n)^2*csgn
(I*x^n)*e*b*Pi-I*x^r*csgn(I*c)*csgn(I*c*x^n)^2*e*b*Pi+I*Pi*b*e*csgn(I*c*x^n
)^3*x^r*r)/(1+r)^2
```

maxima [A] time = 0.96, size = 68, normalized size = 1.19

$$-bdnx + bdx\log\left(cx^n\right) + adx + \frac{bex^{r+1}\log\left(cx^n\right)}{r + 1} - \frac{benx^{r+1}}{(r + 1)^2} + \frac{aex^{r+1}}{r + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -b*d*n*x + b*d*x*log(c*x^n) + a*d*x + b*e*x^(r + 1)*log(c*x^n)/(r + 1) - b*
e*n*x^(r + 1)/(r + 1)^2 + a*e*x^(r + 1)/(r + 1)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int (d + e\,x^r)\,\left(a + b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^r)*(a + b*log(c*x^n)),x)
```

```
[Out] int((d + e*x^r)*(a + b*log(c*x^n)), x)
```

sympy [A] time = 2.37, size = 423, normalized size = 7.42

$$\begin{cases} \frac{adr^2x}{r^2+2r+1} + \frac{2adrx}{r^2+2r+1} + \frac{adx}{r^2+2r+1} + \frac{aerxx^r}{r^2+2r+1} + \frac{aexx^r}{r^2+2r+1} + \frac{bdnr^2x\log(x)}{r^2+2r+1} - \frac{bdnr^2x}{r^2+2r+1} + \frac{2bdnrx\log(x)}{r^2+2r+1} - \frac{2bdnrx}{r^2+2r+1} + \frac{bdnx\log(x)}{r^2+2r+1} - \\ adx + ae\log(x) + bdnx\log(x) - bdnx + bdx\log(c) + \frac{ben\log(x)^2}{2} + be\log(c)\log(x) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((a*d*r**2*x/(r**2 + 2*r + 1) + 2*a*d*r*x/(r**2 + 2*r + 1) + a*d*x
/(r**2 + 2*r + 1) + a*e*r*x*x**r/(r**2 + 2*r + 1) + a*e*x*x**r/(r**2 + 2*r
+ 1) + b*d*n*r**2*x*log(x)/(r**2 + 2*r + 1) - b*d*n*r**2*x/(r**2 + 2*r + 1)
 + 2*b*d*n*r*x*log(x)/(r**2 + 2*r + 1) - 2*b*d*n*r*x/(r**2 + 2*r + 1) + b*d
*n*x*log(x)/(r**2 + 2*r + 1) - b*d*n*x/(r**2 + 2*r + 1) + b*d*r**2*x*log(c)
/(r**2 + 2*r + 1) + 2*b*d*r*x*log(c)/(r**2 + 2*r + 1) + b*d*x*log(c)/(r**2
+ 2*r + 1) + b*e*n*r*x*x**r*log(x)/(r**2 + 2*r + 1) + b*e*n*x*x**r*log(x)/(
r**2 + 2*r + 1) - b*e*n*x*x**r/(r**2 + 2*r + 1) + b*e*r*x*x**r*log(c)/(r**2
 + 2*r + 1) + b*e*x*x**r*log(c)/(r**2 + 2*r + 1), Ne(r, -1)), (a*d*x + a*e*
log(x) + b*d*n*x*log(x) - b*d*n*x + b*d*x*log(c) + b*e*n*log(x)**2/2 + b*e*
log(c)*log(x), True))
```

3.376 $\int \frac{(d+ex^r)(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=67

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{ex^{r-1}\left(a+b\log\left(cx^n\right)\right)}{1-r}-\frac{bdn}{x}-\frac{benx^{r-1}}{(1-r)^2}$$

```
[Out] -b*d*n/x-b*e*n*x^(-1+r)/(1-r)^2-d*(a+b*ln(c*x^n))/x-e*x^(-1+r)*(a+b*ln(c*x^
n))/(1-r)
```

Rubi [A] time = 0.08, antiderivative size = 58, normalized size of antiderivative = 0.87, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$-\left(\frac{d}{x}+\frac{ex^{r-1}}{1-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{x}-\frac{benx^{r-1}}{(1-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d*n)/x) - (b*e*n*x^(-1 + r))/(1 - r)^2 - (d/x + (e*x^(-1 + r))/(1 - r)
)*(a + b*Log[c*x^n])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}
\int \frac{(d+ex^r)\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx &= -\left(\frac{d}{x}+\frac{ex^{-1+r}}{1-r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-d+dr-ex^r}{(1-r)x^2}\,dx\\
&= -\left(\frac{d}{x}+\frac{ex^{-1+r}}{1-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int \frac{-d+dr-ex^r}{x^2}\,dx}{1-r}\\
&= -\left(\frac{d}{x}+\frac{ex^{-1+r}}{1-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int \left(\frac{d(-1+r)}{x^2}-ex^{-2+r}\right)dx}{1-r}\\
&= -\frac{bdn}{x}-\frac{benx^{-1+r}}{(1-r)^2}-\left(\frac{d}{x}+\frac{ex^{-1+r}}{1-r}\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.11, size = 67, normalized size = 1.00

$$-\frac{a(r-1)\,(d(r-1)-ex^r)+b(r-1)\log\left(cx^n\right)(d(r-1)-ex^r)+bn\left(d(r-1)^2+ex^r\right)}{(r-1)^2x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((a*(-1 + r)*(d*(-1 + r) - e*x^r) + b*n*(d*(-1 + r)^2 + e*x^r) + b*(-1 + r
)*(d*(-1 + r) - e*x^r)*Log[c*x^n])/((-1 + r)^2*x))
```

fricas [B] time = 0.50, size = 130, normalized size = 1.94

$$-\frac{bdn+(bdn+ad)r^2+ad-2\,(bdn+ad)r+\left(ben-aer+ae-(ber-be)\log(c)-(benr-ben)\log(x)\right)x^r+\left(bd\right.}{\left(r^2-2\,r+1\right)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -(b*d*n + (b*d*n + a*d)*r^2 + a*d - 2*(b*d*n + a*d)*r + (b*e*n - a*e*r + a*
e - (b*e*r - b*e)*log(c) - (b*e*n*r - b*e*n)*log(x))*x^r + (b*d*r^2 - 2*b*d
*r + b*d)*log(c) + (b*d*n*r^2 - 2*b*d*n*r + b*d*n)*log(x))/((r^2 - 2*r + 1)
*x)
```

giac [B] time = 0.42, size = 193, normalized size = 2.88

$$\frac{bnrx^re\log(x)}{\left(r^2-2\,r+1\right)x}+\frac{brx^re\log(c)}{\left(r^2-2\,r+1\right)x}-\frac{bdn\log(x)}{x}-\frac{bnx^re\log(x)}{\left(r^2-2\,r+1\right)x}-\frac{bdn}{x}-\frac{bnx^re}{\left(r^2-2\,r+1\right)x}+\frac{arx^re}{\left(r^2-2\,r+1\right)x}-\frac{bd\log(c)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] b*n*r*x^r*e*log(x)/((r^2 - 2*r + 1)*x) + b*r*x^r*e*log(c)/((r^2 - 2*r + 1)*
x) - b*d*n*log(x)/x - b*n*x^r*e*log(x)/((r^2 - 2*r + 1)*x) - b*d*n/x - b*n*
x^r*e/((r^2 - 2*r + 1)*x) + a*r*x^r*e/((r^2 - 2*r + 1)*x) - b*d*log(c)/x -
b*x^r*e*log(c)/((r^2 - 2*r + 1)*x) - a*d/x - a*x^r*e/((r^2 - 2*r + 1)*x)
```

maple [C] time = 0.22, size = 614, normalized size = 9.16

$$-\frac{(dr-e\,x^r-d)\,b\ln\left(x^n\right)}{(r-1)\,x}-\frac{2bdn+2ae\,x^r-2aer\,x^r+2ben\,x^r+2bd\,r^2\ln(c)-4bdr\ln(c)+2be\,x^r\ln(c)-4adr+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(b*ln(c*x^n)+a)/x^2,x)
```

```
[Out] -b*(d*r-e*x^r-d)/(-1+r)/x*ln(x^n)-1/2*(2*b*d*n+2*a*e*x^r-2*a*e*r*x^r+2*b*e*
n*x^r+2*b*d*r^2*ln(c)-4*b*d*r*ln(c)+2*b*e*x^r*ln(c)-4*a*d*r+2*a*d+2*b*d*n*r
^2+I*Pi*b*e*r*x^r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+2*a*d*r^2-4*b*d*n*r+2
*b*d*ln(c)-I*Pi*b*e*r*x^r*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*e*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)*x^r-I*Pi*b*e*csgn(I*c*x^n)^3*x^r-I*Pi*b*d*r^2*csgn(
I*c)*csgn(I*x^n)*csgn(I*c*x^n)+I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*
d*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d*csgn(I*c*x^n)^3-I*Pi*b*e*r*x^r*csgn(I*
c)*csgn(I*c*x^n)^2-2*b*e*r*x^r*ln(c)+2*I*Pi*b*d*r*csgn(I*c)*csgn(I*x^n)*csg
n(I*c*x^n)+I*Pi*b*d*r^2*csgn(I*c)*csgn(I*c*x^n)^2-2*I*Pi*b*d*r*csgn(I*c)*cs
gn(I*c*x^n)^2-I*Pi*b*d*r^2*csgn(I*c*x^n)^3+I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*
c)*x^r+I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+I*Pi*b*d*r^2*csgn(I*x^n)*cs
gn(I*c*x^n)^2+2*I*Pi*b*d*r*csgn(I*c*x^n)^3-2*I*Pi*b*d*r*csgn(I*x^n)*csgn(I*
```

```
c*x^n)^2-I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e*r*x^r*csgn(I
*c*x^n)^3)/(-1+r)^2/x
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-2>0)', see `assume?` for more det
ails)Is r-2 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^r)\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)*(a + b*log(c*x^n)))/x^2,x)
```

```
[Out] int(((d + e*x^r)*(a + b*log(c*x^n)))/x^2, x)
```

sympy [A] time = 6.86, size = 449, normalized size = 6.70

$$\begin{cases} -\frac{adr^2}{r^2x-2rx+x}+\frac{2adr}{r^2x-2rx+x}-\frac{ad}{r^2x-2rx+x}+\frac{aerx^r}{r^2x-2rx+x}-\frac{aex^r}{r^2x-2rx+x}-\frac{bdnr^2\log(x)}{r^2x-2rx+x}-\frac{bdnr^2}{r^2x-2rx+x}+\frac{2bdnr\log(x)}{r^2x-2rx+x}+\frac{2bdnr}{r^2x-2rx+x}-\frac{bdn\,\mathrm{lo}}{r^2x-2} \\ -\frac{ad}{x}+ae\log(x)+bd\left(-\frac{n}{x}-\frac{\log(cx^n)}{x}\right)-be\left(\begin{cases}-\log(c)\log(x) & \text{for } n=0 \\ -\frac{\log(cx^n)^2}{2n} & \text{otherwise}\end{cases}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] Piecewise((-a*d*r**2/(r**2*x - 2*r*x + x) + 2*a*d*r/(r**2*x - 2*r*x + x) -
a*d/(r**2*x - 2*r*x + x) + a*e*r*x**r/(r**2*x - 2*r*x + x) - a*e*x**r/(r**2
*x - 2*r*x + x) - b*d*n*r**2*log(x)/(r**2*x - 2*r*x + x) - b*d*n*r**2/(r**2
*x - 2*r*x + x) + 2*b*d*n*r*log(x)/(r**2*x - 2*r*x + x) + 2*b*d*n*r/(r**2*x
 - 2*r*x + x) - b*d*n*log(x)/(r**2*x - 2*r*x + x) - b*d*n/(r**2*x - 2*r*x +
 x) - b*d*r**2*log(c)/(r**2*x - 2*r*x + x) + 2*b*d*r*log(c)/(r**2*x - 2*r*x
 + x) - b*d*log(c)/(r**2*x - 2*r*x + x) + b*e*n*r*x**r*log(x)/(r**2*x - 2*r
*x + x) - b*e*n*x**r*log(x)/(r**2*x - 2*r*x + x) - b*e*n*x**r/(r**2*x - 2*r
*x + x) + b*e*r*x**r*log(c)/(r**2*x - 2*r*x + x) - b*e*x**r*log(c)/(r**2*x
- 2*r*x + x), Ne(r, 1)), (-a*d/x + a*e*log(x) + b*d*(-n/x - log(c*x**n)/x)
- b*e*Piecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True)),
 True))
```

3.377 $\int \frac{(d+ex^r)\left(a+b\log(cx^n)\right)}{x^4}\,dx$

Optimal. Leaf size=71

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{ex^{r-3}\left(a+b\log\left(cx^n\right)\right)}{3-r}-\frac{bdn}{9x^3}-\frac{benx^{r-3}}{(3-r)^2}$$

```
[Out] -1/9*b*d*n/x^3-b*e*n*x^(-3+r)/(3-r)^2-1/3*d*(a+b*ln(c*x^n))/x^3-e*x^(-3+r)*
(a+b*ln(c*x^n))/(3-r)
```

Rubi [A] time = 0.07, antiderivative size = 63, normalized size of antiderivative = 0.89, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$-\frac{1}{3}\left(\frac{d}{x^3}+\frac{3ex^{r-3}}{3-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{9x^3}-\frac{benx^{r-3}}{(3-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d*n)/(9*x^3) - (b*e*n*x^(-3 + r))/(3 - r)^2 - ((d/x^3 + (3*e*x^(-3 + r)
)/(3 - r))*(a + b*Log[c*x^n]))/3
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^r)\left(a+b\log\left(cx^n\right)\right)}{x^4}\,dx &= -\frac{1}{3}\left(\frac{d}{x^3}+\frac{3ex^{-3+r}}{3-r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(-\frac{d}{3x^4}+\frac{ex^{-4+r}}{-3+r}\right)dx\\ &= -\frac{bdn}{9x^3}-\frac{benx^{-3+r}}{(3-r)^2}-\frac{1}{3}\left(\frac{d}{x^3}+\frac{3ex^{-3+r}}{3-r}\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.12, size = 72, normalized size = 1.01

$$-\frac{3a(r-3)\left(d(r-3)-3ex^r\right)+3b(r-3)\log\left(cx^n\right)\left(d(r-3)-3ex^r\right)+bn\left(d(r-3)^2+9ex^r\right)}{9(r-3)^2x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -1/9*(3*a*(-3 + r)*(d*(-3 + r) - 3*e*x^r) + b*n*(d*(-3 + r)^2 + 9*e*x^r) +
3*b*(-3 + r)*(d*(-3 + r) - 3*e*x^r)*Log[c*x^n])/((-3 + r)^2*x^3)
```

fricas [B] time = 0.44, size = 140, normalized size = 1.97

$$-\frac{9\,bdn + (bdn + 3\,ad)r^2 + 27\,ad - 6\,(bdn + 3\,ad)r + 9\left(ben - aer + 3\,ae - (ber - 3\,be)\log(c) - (benr - 3\,ben)\log(\right.}{9\left(r^2 - 6\,r + 9\right)x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(9*b*d*n + (b*d*n + 3*a*d)*r^2 + 27*a*d - 6*(b*d*n + 3*a*d)*r + 9*(b*e
*n - a*e*r + 3*a*e - (b*e*r - 3*b*e)*log(c) - (b*e*n*r - 3*b*e*n)*log(x))*x
^r + 3*(b*d*r^2 - 6*b*d*r + 9*b*d)*log(c) + 3*(b*d*n*r^2 - 6*b*d*n*r + 9*b*
d*n)*log(x))/((r^2 - 6*r + 9)*x^3)
```

giac [B] time = 0.42, size = 397, normalized size = 5.59

$$-\frac{bdnr^2\log(x)}{3\left(r^2-6\,r+9\right)x^3}+\frac{bnrx^re\log(x)}{\left(r^2-6\,r+9\right)x^3}-\frac{bdnr^2}{9\left(r^2-6\,r+9\right)x^3}-\frac{bdr^2\log(c)}{3\left(r^2-6\,r+9\right)x^3}+\frac{brx^re\log(c)}{\left(r^2-6\,r+9\right)x^3}+\frac{2\,bdnr\log(x)}{\left(r^2-6\,r+9\right)x^3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] -1/3*b*d*n*r^2*log(x)/((r^2 - 6*r + 9)*x^3) + b*n*r*x^r*e*log(x)/((r^2 - 6*
r + 9)*x^3) - 1/9*b*d*n*r^2/((r^2 - 6*r + 9)*x^3) - 1/3*b*d*r^2*log(c)/((r^
2 - 6*r + 9)*x^3) + b*r*x^r*e*log(c)/((r^2 - 6*r + 9)*x^3) + 2*b*d*n*r*log(
x)/((r^2 - 6*r + 9)*x^3) - 3*b*n*x^r*e*log(x)/((r^2 - 6*r + 9)*x^3) + 2/3*b
*d*n*r/((r^2 - 6*r + 9)*x^3) - 1/3*a*d*r^2/((r^2 - 6*r + 9)*x^3) - b*n*x^r*
e/((r^2 - 6*r + 9)*x^3) + a*r*x^r*e/((r^2 - 6*r + 9)*x^3) + 2*b*d*r*log(c)/
((r^2 - 6*r + 9)*x^3) - 3*b*x^r*e*log(c)/((r^2 - 6*r + 9)*x^3) - 3*b*d*n*lo
g(x)/((r^2 - 6*r + 9)*x^3) - b*d*n/((r^2 - 6*r + 9)*x^3) + 2*a*d*r/((r^2 -
6*r + 9)*x^3) - 3*a*x^r*e/((r^2 - 6*r + 9)*x^3) - 3*b*d*log(c)/((r^2 - 6*r
+ 9)*x^3) - 3*a*d/((r^2 - 6*r + 9)*x^3)
```

maple [C] time = 0.23, size = 614, normalized size = 8.65

$$-\frac{(dr - 3e\,x^r - 3d)\,b\ln(x^n)}{3\,(r-3)\,x^3}-\frac{18bdn + 54ae\,x^r - 18aer\,x^r + 18ben\,x^r + 6bd\,r^2\ln(c) - 36bdr\ln(c) + 54be\,x^r\ln(c) - 3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(b*ln(c*x^n)+a)/x^4,x)
```

```
[Out] -1/3*b*(d*r-3*e*x^r-3*d)/(-3+r)/x^3*ln(x^n)-1/18*(18*b*d*n+54*a*e*x^r-18*a*
e*r*x^r+18*b*e*n*x^r+6*b*d*r^2*ln(c)-36*b*d*r*ln(c)+54*b*e*x^r*ln(c)-27*I*P
i*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-36*a*d*r+54*a*d+2*b*d*n*r^2+6*a*d
*r^2-12*b*d*n*r+54*b*d*ln(c)-18*I*Pi*b*d*r*csgn(I*c)*csgn(I*c*x^n)^2-18*b*e
*r*x^r*ln(c)-9*I*Pi*b*e*r*x^r*csgn(I*x^n)*csgn(I*c*x^n)^2-9*I*Pi*b*e*r*x^r*
csgn(I*c)*csgn(I*c*x^n)^2+18*I*Pi*b*d*r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)
-27*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-3*I*Pi*b*d*r^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-27*I*Pi*b*d*csgn(I*c*x^n)^3+9*I*Pi*b*e*r*x^r*c
sgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-18*I*Pi*b*d*r*csgn(I*x^n)*csgn(I*c*x^n)^
2+9*I*Pi*b*e*r*x^r*csgn(I*c*x^n)^3+18*I*Pi*b*d*r*csgn(I*c*x^n)^3+27*I*Pi*b*
d*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*d*r^2*csgn(I*c*x^n)^3+3*I*Pi*b*d*r^2
*csgn(I*c*x^n)^2*csgn(I*c)+27*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+27*I*P
i*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+3*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x
^n)^2-27*I*Pi*b*e*csgn(I*c*x^n)^3*x^r+27*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)
)/(-3+r)^2/x^3
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-4>0)', see `assume?` for more det
ails)Is r-4 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d + e\,x^r)\,\left(a + b\,\ln\left(c\,x^n\right)\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)*(a + b*log(c*x^n)))/x^4,x)
```

```
[Out] int(((d + e*x^r)*(a + b*log(c*x^n)))/x^4, x)
```

sympy [A] time = 14.95, size = 644, normalized size = 9.07

$$\begin{cases} -\frac{3adr^2}{9r^2x^3-54rx^3+81x^3} + \frac{18adr}{9r^2x^3-54rx^3+81x^3} - \frac{27ad}{9r^2x^3-54rx^3+81x^3} + \frac{9aerx^r}{9r^2x^3-54rx^3+81x^3} - \frac{27aex^r}{9r^2x^3-54rx^3+81x^3} - \frac{3bdnr^2\log(x)}{9r^2x^3-54rx^3+81x^3} - \frac{}{9r} \\ -\frac{ad}{3x^3} + ae\log(x) + bd\left(-\frac{n}{9x^3} - \frac{\log(cx^n)}{3x^3}\right) - be\left(\begin{cases} -\log(c)\log(x) & \text{for}\ n = 0 \\ -\frac{\log(cx^n)^2}{2n} & \text{otherwise} \end{cases}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] Piecewise((-3*a*d*r**2/(9*r**2*x**3 - 54*r*x**3 + 81*x**3) + 18*a*d*r/(9*r*
*2*x**3 - 54*r*x**3 + 81*x**3) - 27*a*d/(9*r**2*x**3 - 54*r*x**3 + 81*x**3)
 + 9*a*e*r*x**r/(9*r**2*x**3 - 54*r*x**3 + 81*x**3) - 27*a*e*x**r/(9*r**2*x
**3 - 54*r*x**3 + 81*x**3) - 3*b*d*n*r**2*log(x)/(9*r**2*x**3 - 54*r*x**3 +
 81*x**3) - b*d*n*r**2/(9*r**2*x**3 - 54*r*x**3 + 81*x**3) + 18*b*d*n*r*log
(x)/(9*r**2*x**3 - 54*r*x**3 + 81*x**3) + 6*b*d*n*r/(9*r**2*x**3 - 54*r*x**
3 + 81*x**3) - 27*b*d*n*log(x)/(9*r**2*x**3 - 54*r*x**3 + 81*x**3) - 9*b*d*
n/(9*r**2*x**3 - 54*r*x**3 + 81*x**3) - 3*b*d*r**2*log(c)/(9*r**2*x**3 - 54
*r*x**3 + 81*x**3) + 18*b*d*r*log(c)/(9*r**2*x**3 - 54*r*x**3 + 81*x**3) -
27*b*d*log(c)/(9*r**2*x**3 - 54*r*x**3 + 81*x**3) + 9*b*e*n*r*x**r*log(x)/(
9*r**2*x**3 - 54*r*x**3 + 81*x**3) - 27*b*e*n*x**r*log(x)/(9*r**2*x**3 - 54
*r*x**3 + 81*x**3) - 9*b*e*n*x**r/(9*r**2*x**3 - 54*r*x**3 + 81*x**3) + 9*b
*e*r*x**r*log(c)/(9*r**2*x**3 - 54*r*x**3 + 81*x**3) - 27*b*e*x**r*log(c)/(
9*r**2*x**3 - 54*r*x**3 + 81*x**3), Ne(r, 3)), (-a*d/(3*x**3) + a*e*log(x)
+ b*d*(-n/(9*x**3) - log(c*x**n)/(3*x**3)) - b*e*Piecewise((-log(c)*log(x),
 Eq(n, 0)), (-log(c*x**n)**2/(2*n), True)), True))
```

3.378 $\int \frac{(d+ex^r)\left(a+b\log(cx^n)\right)}{x^6}\,dx$

Optimal. Leaf size=71

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{ex^{r-5}\left(a+b\log\left(cx^n\right)\right)}{5-r}-\frac{bdn}{25x^5}-\frac{benx^{r-5}}{(5-r)^2}$$

```
[Out] -1/25*b*d*n/x^5-b*e*n*x^(-5+r)/(5-r)^2-1/5*d*(a+b*ln(c*x^n))/x^5-e*x^(-5+r)
*(a+b*ln(c*x^n))/(5-r)
```

Rubi [A] time = 0.07, antiderivative size = 63, normalized size of antiderivative = 0.89, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$-\frac{1}{5}\left(\frac{d}{x^5}+\frac{5ex^{r-5}}{5-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{25x^5}-\frac{benx^{r-5}}{(5-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d*n)/(25*x^5) - (b*e*n*x^(-5 + r))/(5 - r)^2 - ((d/x^5 + (5*e*x^(-5 + r
))/(5 - r))*(a + b*Log[c*x^n]))/5
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^r)\left(a+b\log\left(cx^n\right)\right)}{x^6}\,dx &= -\frac{1}{5}\left(\frac{d}{x^5}+\frac{5ex^{-5+r}}{5-r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(-\frac{d}{5x^6}+\frac{ex^{-6+r}}{-5+r}\right)dx\\ &= -\frac{bdn}{25x^5}-\frac{benx^{-5+r}}{(5-r)^2}-\frac{1}{5}\left(\frac{d}{x^5}+\frac{5ex^{-5+r}}{5-r}\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.10, size = 72, normalized size = 1.01

$$-\frac{5a(r-5)\left(d(r-5)-5ex^r\right)+5b(r-5)\log\left(cx^n\right)\left(d(r-5)-5ex^r\right)+bn\left(d(r-5)^2+25ex^r\right)}{25(r-5)^2x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -1/25*(5*a*(-5 + r)*(d*(-5 + r) - 5*e*x^r) + b*n*(d*(-5 + r)^2 + 25*e*x^r)
+ 5*b*(-5 + r)*(d*(-5 + r) - 5*e*x^r)*Log[c*x^n])/((-5 + r)^2*x^5)
```

fricas [B] time = 0.46, size = 140, normalized size = 1.97

$$-\frac{25\,bdn + (bdn + 5\,ad)r^2 + 125\,ad - 10\,(bdn + 5\,ad)r + 25\left(ben - aer + 5\,ae - (ber - 5\,be)\log(c) - (benr - 5\,b\right.}{25\left(r^2 - 10\,r + 25\right)x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/25*(25*b*d*n + (b*d*n + 5*a*d)*r^2 + 125*a*d - 10*(b*d*n + 5*a*d)*r + 25
*(b*e*n - a*e*r + 5*a*e - (b*e*r - 5*b*e)*log(c) - (b*e*n*r - 5*b*e*n)*log(
x))*x^r + 5*(b*d*r^2 - 10*b*d*r + 25*b*d)*log(c) + 5*(b*d*n*r^2 - 10*b*d*n*
r + 25*b*d*n)*log(x))/((r^2 - 10*r + 25)*x^5)
```

giac [B] time = 0.47, size = 397, normalized size = 5.59

$$-\frac{bdnr^2\log(x)}{5\left(r^2 - 10\,r + 25\right)x^5} + \frac{bnrx^r e\log(x)}{\left(r^2 - 10\,r + 25\right)x^5} - \frac{bdnr^2}{25\left(r^2 - 10\,r + 25\right)x^5} - \frac{bdr^2\log(c)}{5\left(r^2 - 10\,r + 25\right)x^5} + \frac{brx^r e\log(c)}{\left(r^2 - 10\,r + 25\right)x^5} + \cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] -1/5*b*d*n*r^2*log(x)/((r^2 - 10*r + 25)*x^5) + b*n*r*x^r*e*log(x)/((r^2 -
10*r + 25)*x^5) - 1/25*b*d*n*r^2/((r^2 - 10*r + 25)*x^5) - 1/5*b*d*r^2*log(
c)/((r^2 - 10*r + 25)*x^5) + b*r*x^r*e*log(c)/((r^2 - 10*r + 25)*x^5) + 2*b
*d*n*r*log(x)/((r^2 - 10*r + 25)*x^5) - 5*b*n*x^r*e*log(x)/((r^2 - 10*r + 2
5)*x^5) + 2/5*b*d*n*r/((r^2 - 10*r + 25)*x^5) - 1/5*a*d*r^2/((r^2 - 10*r +
25)*x^5) - b*n*x^r*e/((r^2 - 10*r + 25)*x^5) + a*r*x^r*e/((r^2 - 10*r + 25)
*x^5) + 2*b*d*r*log(c)/((r^2 - 10*r + 25)*x^5) - 5*b*x^r*e*log(c)/((r^2 - 1
0*r + 25)*x^5) - 5*b*d*n*log(x)/((r^2 - 10*r + 25)*x^5) - b*d*n/((r^2 - 10*
r + 25)*x^5) + 2*a*d*r/((r^2 - 10*r + 25)*x^5) - 5*a*x^r*e/((r^2 - 10*r + 2
5)*x^5) - 5*b*d*log(c)/((r^2 - 10*r + 25)*x^5) - 5*a*d/((r^2 - 10*r + 25)*x
^5)
```

maple [C] time = 0.24, size = 614, normalized size = 8.65

$$-\frac{(dr - 5e\,x^r - 5d)\,b\ln\left(x^n\right)}{5\,(r-5)\,x^5} - \frac{50bdn + 250ae\,x^r - 50aer\,x^r + 50ben\,x^r + 10bd\,r^2\ln(c) - 100bdr\ln(c) + 250be\,x^r \cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(b*ln(c*x^n)+a)/x^6,x)
```

```
[Out] -1/5*b*(d*r-5*e*x^r-5*d)/(-5+r)/x^5*ln(x^n)-1/50*(50*b*d*n+250*a*e*x^r-50*a
*e*r*x^r+50*b*e*n*x^r+10*b*d*r^2*ln(c)-100*b*d*r*ln(c)+250*b*e*x^r*ln(c)-12
5*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-100*a*d*r+250*a*d+2*b*d*n*r^
2+10*a*d*r^2-20*b*d*n*r+250*b*d*ln(c)+25*I*Pi*b*e*r*x^r*csgn(I*c)*csgn(I*x^
n)*csgn(I*c*x^n)-125*I*Pi*b*d*csgn(I*c*x^n)^3-25*I*Pi*b*e*r*x^r*csgn(I*x^n)
*csgn(I*c*x^n)^2-25*I*Pi*b*e*r*x^r*csgn(I*c)*csgn(I*c*x^n)^2+50*I*Pi*b*d*r*
csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+50*I*Pi*b*d*r*csgn(I*c*x^n)^3-50*b*e*r*
x^r*ln(c)-50*I*Pi*b*d*r*csgn(I*c)*csgn(I*c*x^n)^2-50*I*Pi*b*d*r*csgn(I*x^n)
*csgn(I*c*x^n)^2-5*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-125*I*P
i*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+25*I*Pi*b*e*r*x^r*csgn(I*c*x^
n)^3+125*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+125*I*Pi*b*d*csgn(I*x^n)*csgn(I
*c*x^n)^2-5*I*Pi*b*d*r^2*csgn(I*c*x^n)^3-125*I*Pi*b*e*csgn(I*c*x^n)^3*x^r+1
25*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+5*I*Pi*b*d*r^2*csgn(I*x^n)*csgn
(I*c*x^n)^2+5*I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)+125*I*Pi*b*e*csgn(I*c*
x^n)^2*csgn(I*c)*x^r)/(-5+r)^2/x^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-6>0)', see `assume?` for more det
ails)Is r-6 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^r)\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)*(a + b*log(c*x^n)))/x^6,x)
```

```
[Out] int(((d + e*x^r)*(a + b*log(c*x^n)))/x^6, x)
```

sympy [A] time = 53.33, size = 644, normalized size = 9.07

$$\begin{cases} -\frac{5adr^2}{25r^2x^5-250rx^5+625x^5} + \frac{50adr}{25r^2x^5-250rx^5+625x^5} - \frac{125ad}{25r^2x^5-250rx^5+625x^5} + \frac{25aerx^r}{25r^2x^5-250rx^5+625x^5} - \frac{125aex^r}{25r^2x^5-250rx^5+625x^5} - \frac{5bdnr^2}{25r^2x^5-25\cdots} \\ -\frac{ad}{5x^5} + ae\log(x) + bd\left(-\frac{n}{25x^5} - \frac{\log(cx^n)}{5x^5}\right) - be\left(\begin{cases} -\log(c)\log(x) & \text{for } n=0 \\ -\frac{\log(cx^n)^2}{2n} & \text{otherwise} \end{cases}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] Piecewise((-5*a*d*r**2/(25*r**2*x**5 - 250*r*x**5 + 625*x**5) + 50*a*d*r/(2
5*r**2*x**5 - 250*r*x**5 + 625*x**5) - 125*a*d/(25*r**2*x**5 - 250*r*x**5 +
 625*x**5) + 25*a*e*r*x**r/(25*r**2*x**5 - 250*r*x**5 + 625*x**5) - 125*a*e
*x**r/(25*r**2*x**5 - 250*r*x**5 + 625*x**5) - 5*b*d*n*r**2*log(x)/(25*r**2
*x**5 - 250*r*x**5 + 625*x**5) - b*d*n*r**2/(25*r**2*x**5 - 250*r*x**5 + 62
5*x**5) + 50*b*d*n*r*log(x)/(25*r**2*x**5 - 250*r*x**5 + 625*x**5) + 10*b*d
*n*r/(25*r**2*x**5 - 250*r*x**5 + 625*x**5) - 125*b*d*n*log(x)/(25*r**2*x**
5 - 250*r*x**5 + 625*x**5) - 25*b*d*n/(25*r**2*x**5 - 250*r*x**5 + 625*x**5
) - 5*b*d*r**2*log(c)/(25*r**2*x**5 - 250*r*x**5 + 625*x**5) + 50*b*d*r*log
(c)/(25*r**2*x**5 - 250*r*x**5 + 625*x**5) - 125*b*d*log(c)/(25*r**2*x**5 -
 250*r*x**5 + 625*x**5) + 25*b*e*n*r*x**r*log(x)/(25*r**2*x**5 - 250*r*x**5
 + 625*x**5) - 125*b*e*n*x**r*log(x)/(25*r**2*x**5 - 250*r*x**5 + 625*x**5)
 - 25*b*e*n*x**r/(25*r**2*x**5 - 250*r*x**5 + 625*x**5) + 25*b*e*r*x**r*log
(c)/(25*r**2*x**5 - 250*r*x**5 + 625*x**5) - 125*b*e*x**r*log(c)/(25*r**2*x
**5 - 250*r*x**5 + 625*x**5), Ne(r, 5)), (-a*d/(5*x**5) + a*e*log(x) + b*d*
(-n/(25*x**5) - log(c*x**n)/(5*x**5)) - b*e*Piecewise((-log(c)*log(x), Eq(n
, 0)), (-log(c*x**n)**2/(2*n), True)), True))
```

3.379 $\int x^5 (d+ex^r)^2 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=103

$$\frac{1}{6}\left(d^2x^6+\frac{12dex^{r+6}}{r+6}+\frac{3e^2x^{2(r+3)}}{r+3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{36}bd^2nx^6-\frac{2bdenx^{r+6}}{(r+6)^2}-\frac{be^2nx^{2(r+3)}}{4(r+3)^2}$$

```
[Out] -1/36*b*d^2*n*x^6-1/4*b*e^2*n*x^(6+2*r)/(3+r)^2-2*b*d*e*n*x^(6+r)/(6+r)^2+1
/6*(d^2*x^6+3*e^2*x^(6+2*r)/(3+r)+12*d*e*x^(6+r)/(6+r))*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.16, antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{6}\left(d^2x^6+\frac{12dex^{r+6}}{r+6}+\frac{3e^2x^{2(r+3)}}{r+3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{36}bd^2nx^6-\frac{2bdenx^{r+6}}{(r+6)^2}-\frac{be^2nx^{2(r+3)}}{4(r+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^6)/36 - (b*e^2*n*x^(2*(3 + r)))/(4*(3 + r)^2) - (2*b*d*e*n*x^(6
 + r))/(6 + r)^2 + ((d^2*x^6 + (3*e^2*x^(2*(3 + r)))/(3 + r) + (12*d*e*x^(6
 + r))/(6 + r))*(a + b*Log[c*x^n]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^5 (d+ex^r)^2 \left(a+b\log(cx^n)\right) dx = \frac{1}{6}\left(d^2x^6+\frac{3e^2x^{2(3+r)}}{3+r}+\frac{12dex^{6+r}}{6+r}\right)\left(a+b\log(cx^n)\right)-(bn)\int \frac{1}{6}x^5\left(d^2+\frac{12\ldots}{6}\right.$$
$$=\frac{1}{6}\left(d^2x^6+\frac{3e^2x^{2(3+r)}}{3+r}+\frac{12dex^{6+r}}{6+r}\right)\left(a+b\log(cx^n)\right)-\frac{1}{6}(bn)\int x^5\left(d^2+\frac{12\ldots}{6}\right.$$
$$=\frac{1}{6}\left(d^2x^6+\frac{3e^2x^{2(3+r)}}{3+r}+\frac{12dex^{6+r}}{6+r}\right)\left(a+b\log(cx^n)\right)-\frac{1}{6}(bn)\int\left(d^2x^5+\frac{12\ldots}{6}\right.$$
$$=-\frac{1}{36}bd^2nx^6-\frac{be^2nx^{2(3+r)}}{4(3+r)^2}-\frac{2bdenx^{6+r}}{(6+r)^2}+\frac{1}{6}\left(d^2x^6+\frac{3e^2x^{2(3+r)}}{3+r}+\frac{12dex^{6+r}}{6+r}\right.$$

Mathematica [A] time = 0.28, size = 118, normalized size = 1.15

$$\frac{1}{36}x^6\left(6a\left(d^2+\frac{12dex^r}{r+6}+\frac{3e^2x^{2r}}{r+3}\right)+6b\log(cx^n)\left(d^2+\frac{12dex^r}{r+6}+\frac{3e^2x^{2r}}{r+3}\right)+bn\left(-d^2-\frac{72dex^r}{(r+6)^2}-\frac{9e^2x^{2r}}{(r+3)^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^6*(b*n*(-d^2 - (72*d*e*x^r)/(6 + r)^2 - (9*e^2*x^(2*r))/(3 + r)^2) + 6*a
*(d^2 + (12*d*e*x^r)/(6 + r) + (3*e^2*x^(2*r))/(3 + r)) + 6*b*(d^2 + (12*d*
e*x^r)/(6 + r) + (3*e^2*x^(2*r))/(3 + r))*Log[c*x^n]))/36
```

fricas [B] time = 0.47, size = 489, normalized size = 4.75

$$\frac{6\left(bd^2r^4+18\,bd^2r^3+117\,bd^2r^2+324\,bd^2r+324\,bd^2\right)x^6\log(c)+6\left(bd^2nr^4+18\,bd^2nr^3+117\,bd^2nr^2+324\,bd^2n\ldots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/36*(6*(b*d^2*r^4 + 18*b*d^2*r^3 + 117*b*d^2*r^2 + 324*b*d^2*r + 324*b*d^2
)*x^6*log(c) + 6*(b*d^2*n*r^4 + 18*b*d^2*n*r^3 + 117*b*d^2*n*r^2 + 324*b*d^
2*n*r + 324*b*d^2*n)*x^6*log(x) - ((b*d^2*n - 6*a*d^2)*r^4 + 324*b*d^2*n +
18*(b*d^2*n - 6*a*d^2)*r^3 - 1944*a*d^2 + 117*(b*d^2*n - 6*a*d^2)*r^2 + 324
*(b*d^2*n - 6*a*d^2)*r)*x^6 + 9*(2*(b*e^2*r^3 + 15*b*e^2*r^2 + 72*b*e^2*r +
 108*b*e^2)*x^6*log(c) + 2*(b*e^2*n*r^3 + 15*b*e^2*n*r^2 + 72*b*e^2*n*r + 1
08*b*e^2*n)*x^6*log(x) + (2*a*e^2*r^3 - 36*b*e^2*n + 216*a*e^2 - (b*e^2*n -
 30*a*e^2)*r^2 - 12*(b*e^2*n - 12*a*e^2)*r)*x^6)*x^(2*r) + 72*((b*d*e*r^3 +
 12*b*d*e*r^2 + 45*b*d*e*r + 54*b*d*e)*x^6*log(c) + (b*d*e*n*r^3 + 12*b*d*e
*n*r^2 + 45*b*d*e*n*r + 54*b*d*e*n)*x^6*log(x) + (a*d*e*r^3 - 9*b*d*e*n + 5
4*a*d*e - (b*d*e*n - 12*a*d*e)*r^2 - 3*(2*b*d*e*n - 15*a*d*e)*r)*x^6)*x^r)/
(r^4 + 18*r^3 + 117*r^2 + 324*r + 324)
```

giac [B] time = 0.50, size = 744, normalized size = 7.22

$$\frac{6\,bd^2nr^4x^6\log(x)+72\,bdnr^3x^6x^re\log(x)-bd^2nr^4x^6+6\,bd^2r^4x^6\log(c)+72\,bdr^3x^6x^re\log(c)+108\,bd^2nr^3x^6\log\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/36*(6*b*d^2*n*r^4*x^6*log(x) + 72*b*d*n*r^3*x^6*x^r*e*log(x) - b*d^2*n*r^
4*x^6 + 6*b*d^2*r^4*x^6*log(c) + 72*b*d*r^3*x^6*x^r*e*log(c) + 108*b*d^2*n*
r^3*x^6*log(x) + 18*b*n*r^3*x^6*x^(2*r)*e^2*log(x) + 864*b*d*n*r^2*x^6*x^r*
```

```
e*log(x) - 18*b*d^2*n*r^3*x^6 + 6*a*d^2*r^4*x^6 - 72*b*d*n*r^2*x^6*x^r*e +
72*a*d*r^3*x^6*x^r*e + 108*b*d^2*r^3*x^6*log(c) + 18*b*r^3*x^6*x^(2*r)*e^2*
log(c) + 864*b*d*r^2*x^6*x^r*e*log(c) + 702*b*d^2*n*r^2*x^6*log(x) + 270*b*
n*r^2*x^6*x^(2*r)*e^2*log(x) + 3240*b*d*n*r*x^6*x^r*e*log(x) - 117*b*d^2*n*
r^2*x^6 + 108*a*d^2*r^3*x^6 - 9*b*n*r^2*x^6*x^(2*r)*e^2 + 18*a*r^3*x^6*x^(2
*r)*e^2 - 432*b*d*n*r*x^6*x^r*e + 864*a*d*r^2*x^6*x^r*e + 702*b*d^2*r^2*x^6
*log(c) + 270*b*r^2*x^6*x^(2*r)*e^2*log(c) + 3240*b*d*r*x^6*x^r*e*log(c) +
1944*b*d^2*n*r*x^6*log(x) + 1296*b*n*r*x^6*x^(2*r)*e^2*log(x) + 3888*b*d*n*
x^6*x^r*e*log(x) - 324*b*d^2*n*r*x^6 + 702*a*d^2*r^2*x^6 - 108*b*n*r*x^6*x^
(2*r)*e^2 + 270*a*r^2*x^6*x^(2*r)*e^2 - 648*b*d*n*x^6*x^r*e + 3240*a*d*r*x^
6*x^r*e + 1944*b*d^2*r*x^6*log(c) + 1296*b*r*x^6*x^(2*r)*e^2*log(c) + 3888*
b*d*x^6*x^r*e*log(c) + 1944*b*d^2*n*x^6*log(x) + 1944*b*n*x^6*x^(2*r)*e^2*l
og(x) - 324*b*d^2*n*x^6 + 1944*a*d^2*r*x^6 - 324*b*n*x^6*x^(2*r)*e^2 + 1296
*a*r*x^6*x^(2*r)*e^2 + 3888*a*d*x^6*x^r*e + 1944*b*d^2*x^6*log(c) + 1944*b*
x^6*x^(2*r)*e^2*log(c) + 1944*a*d^2*x^6 + 1944*a*x^6*x^(2*r)*e^2)/(r^4 + 18
*r^3 + 117*r^2 + 324*r + 324)
```

maple [C] time = 0.35, size = 1924, normalized size = 18.68

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d+e*x^r)^2*(b*ln(c*x^n)+a),x)

[Out] 1/6*x^6*b*(3*e^2*(x^r)^2*r+d^2*r^2+12*d*e*x^r*r+18*(x^r)^2*e^2+9*d^2*r+36*x
^r*d*e+18*d^2)/(r+3)/(r+6)*ln(x^n)-1/36*x^6*(36*I*Pi*b*d*e*r^3*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)*x^r-1944*ln(c)*b*e^2*(x^r)^2-18*a*e^2*r^3*(x^r)^2-3
888*a*d*e*x^r-270*a*e^2*r^2*(x^r)^2-1296*a*e^2*r*(x^r)^2+324*b*e^2*n*(x^r)^
2-6*ln(c)*b*d^2*r^4-108*ln(c)*b*d^2*r^3-702*ln(c)*b*d^2*r^2-1944*ln(c)*b*d^
2*r-1944*a*d^2+b*d^2*n*r^4+18*b*d^2*n*r^3+324*b*d^2*n-1944*a*e^2*(x^r)^2-19
44*b*d^2*ln(c)-6*a*d^2*r^4+117*b*d^2*n*r^2+324*b*d^2*n*r-702*a*d^2*r^2-1944
*a*d^2*r-108*a*d^2*r^3+3*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3+54*I*Pi*b*d^2*r^3*c
sgn(I*c*x^n)^3+972*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+972*I*Pi*b*d^2*csgn(I
*c*x^n)^3+648*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-972*I*Pi*b*e^2*csgn(I*x^
n)*csgn(I*c*x^n)^2*(x^r)^2+9*b*e^2*n*r^2*(x^r)^2-72*a*d*e*r^3*x^r-864*a*d*e
*r^2*x^r-3240*a*d*e*r*x^r+108*b*e^2*n*r*(x^r)^2+648*b*d*e*n*x^r-270*ln(c)*b
*e^2*r^2*(x^r)^2-1296*ln(c)*b*e^2*r*(x^r)^2-3888*ln(c)*b*d*e*x^r-18*ln(c)*b
*e^2*r^3*(x^r)^2-351*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b*d^2*
r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)-
972*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+9*I*Pi*b*e^2*r^3*csgn(I*c*
x^n)^3*(x^r)^2-972*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-972*I*Pi*b*d^2*
r*csgn(I*c*x^n)^2*csgn(I*c)+432*b*d*e*n*r*x^r+72*b*d*e*n*r^2*x^r-864*ln(c)*
b*d*e*r^2*x^r-3240*ln(c)*b*d*e*r*x^r-72*ln(c)*b*d*e*r^3*x^r-972*I*Pi*b*d^2*
csgn(I*c*x^n)^2*csgn(I*c)+1620*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*x^r-54*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-54*I*Pi*b*d^2*r^3*cs
gn(I*c*x^n)^2*csgn(I*c)+1944*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+135*I*Pi*b*e^2*
r^2*csgn(I*c*x^n)^3*(x^r)^2+972*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)-351*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+351*I*Pi*b*d^2*r^2*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(
x^r)^2-1944*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1944*I*Pi*b*d*e*csgn
(I*c*x^n)^2*csgn(I*c)*x^r+3*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)+1620*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r+972*I*Pi*b*e^2*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*(x^r)^2-648*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^
2+54*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-135*I*Pi*b*e^2*r^2*
csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+432*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^3*x^r+36
*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^r-648*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x
^n)^2*(x^r)^2-135*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-9*I*Pi
*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+972*I*Pi*b*d^2*r*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)+9*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*(x^r)^2-36*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-36*I*Pi*b*d*e*
```

```
r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+1944*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*x^r-1620*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+135*I*Pi*b*e
^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+648*I*Pi*b*e^2*r*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-1620*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c
*x^n)^2*x^r-432*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-432*I*Pi*b*d
*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+351*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+972
*I*Pi*b*d^2*r*csgn(I*c*x^n)^3-972*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+43
2*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r)/(r+3)^2/(r+6)^2
```

maxima [A] time = 1.09, size = 148, normalized size = 1.44

$$-\frac{1}{36}\,bd^2nx^6+\frac{1}{6}\,bd^2x^6\log\left(cx^n\right)+\frac{1}{6}\,ad^2x^6+\frac{be^2x^{2\,r+6}\log\left(cx^n\right)}{2\,(r+3)}+\frac{2\,bdex^{r+6}\log\left(cx^n\right)}{r+6}-\frac{be^2nx^{2\,r+6}}{4\,(r+3)^2}+\frac{ae^2x^{2\,r+6}}{2\,(r+3)}-\frac{2\,bdenx}{(r+6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/36*b*d^2*n*x^6 + 1/6*b*d^2*x^6*log(c*x^n) + 1/6*a*d^2*x^6 + 1/2*b*e^2*x^
(2*r + 6)*log(c*x^n)/(r + 3) + 2*b*d*e*x^(r + 6)*log(c*x^n)/(r + 6) - 1/4*b
*e^2*n*x^(2*r + 6)/(r + 3)^2 + 1/2*a*e^2*x^(2*r + 6)/(r + 3) - 2*b*d*e*n*x^
(r + 6)/(r + 6)^2 + 2*a*d*e*x^(r + 6)/(r + 6)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^5\,\left(d+e\,x^r\right)^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d + e*x^r)^2*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^5*(d + e*x^r)^2*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.380 $\int x^3 (d + ex^r)^2 (a + b\log(cx^n))\, dx$

Optimal. Leaf size=103

$$\frac{1}{4}\left(d^2x^4 + \frac{8dex^{r+4}}{r+4} + \frac{2e^2x^{2(r+2)}}{r+2}\right)\left(a + b\log\left(cx^n\right)\right) - \frac{1}{16}bd^2nx^4 - \frac{2bdenx^{r+4}}{(r+4)^2} - \frac{be^2nx^{2(r+2)}}{4(r+2)^2}$$

```
[Out] -1/16*b*d^2*n*x^4-1/4*b*e^2*n*x^(4+2*r)/(2+r)^2-2*b*d*e*n*x^(4+r)/(4+r)^2+1
/4*(d^2*x^4+2*e^2*x^(4+2*r)/(2+r)+8*d*e*x^(4+r)/(4+r))*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.15, antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {270, 2334, 12, 14}

$$\frac{1}{4}\left(d^2x^4 + \frac{8dex^{r+4}}{r+4} + \frac{2e^2x^{2(r+2)}}{r+2}\right)\left(a + b\log\left(cx^n\right)\right) - \frac{1}{16}bd^2nx^4 - \frac{2bdenx^{r+4}}{(r+4)^2} - \frac{be^2nx^{2(r+2)}}{4(r+2)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^4)/16 - (b*e^2*n*x^(2*(2 + r)))/(4*(2 + r)^2) - (2*b*d*e*n*x^(4
 + r))/(4 + r)^2 + ((d^2*x^4 + (2*e^2*x^(2*(2 + r)))/(2 + r) + (8*d*e*x^(4
+ r))/(4 + r))*(a + b*Log[c*x^n]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^3 (d+ex^r)^2 \left(a+b\log(cx^n)\right) dx = \frac{1}{4}\left(d^2x^4+\frac{2e^2x^{2(2+r)}}{2+r}+\frac{8dex^{4+r}}{4+r}\right)\left(a+b\log(cx^n)\right)-(bn)\int \frac{1}{4}x^3\left(d^2+\frac{8de}{4+}\right.$$
$$=\frac{1}{4}\left(d^2x^4+\frac{2e^2x^{2(2+r)}}{2+r}+\frac{8dex^{4+r}}{4+r}\right)\left(a+b\log(cx^n)\right)-\frac{1}{4}(bn)\int x^3\left(d^2+\frac{8de}{4+}\right.$$
$$=\frac{1}{4}\left(d^2x^4+\frac{2e^2x^{2(2+r)}}{2+r}+\frac{8dex^{4+r}}{4+r}\right)\left(a+b\log(cx^n)\right)-\frac{1}{4}(bn)\int\left(d^2x^3+\frac{8de}{4+}\right.$$
$$=-\frac{1}{16}bd^2nx^4-\frac{be^2nx^{2(2+r)}}{4(2+r)^2}-\frac{2bdenx^{4+r}}{(4+r)^2}+\frac{1}{4}\left(d^2x^4+\frac{2e^2x^{2(2+r)}}{2+r}+\frac{8dex^{4+r}}{4+r}\right)$$

Mathematica [**A**] time = 0.26, size = 118, normalized size = 1.15

$$\frac{1}{16}x^4\left(4a\left(d^2+\frac{8dex^r}{r+4}+\frac{2e^2x^{2r}}{r+2}\right)+4b\log(cx^n)\left(d^2+\frac{8dex^r}{r+4}+\frac{2e^2x^{2r}}{r+2}\right)+bn\left(-d^2-\frac{32dex^r}{(r+4)^2}-\frac{4e^2x^{2r}}{(r+2)^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(b*n*(-d^2 - (32*d*e*x^r)/(4 + r)^2 - (4*e^2*x^(2*r))/(2 + r)^2) + 4*a
*(d^2 + (8*d*e*x^r)/(4 + r) + (2*e^2*x^(2*r))/(2 + r)) + 4*b*(d^2 + (8*d*e*
x^r)/(4 + r) + (2*e^2*x^(2*r))/(2 + r))*Log[c*x^n]))/16
```

fricas [**B**] time = 0.45, size = 488, normalized size = 4.74

$$\frac{4\left(bd^2r^4+12\,bd^2r^3+52\,bd^2r^2+96\,bd^2r+64\,bd^2\right)x^4\log(c)+4\left(bd^2nr^4+12\,bd^2nr^3+52\,bd^2nr^2+96\,bd^2nr+64\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/16*(4*(b*d^2*r^4 + 12*b*d^2*r^3 + 52*b*d^2*r^2 + 96*b*d^2*r + 64*b*d^2)*x
^4*log(c) + 4*(b*d^2*n*r^4 + 12*b*d^2*n*r^3 + 52*b*d^2*n*r^2 + 96*b*d^2*n*r
 + 64*b*d^2*n)*x^4*log(x) - ((b*d^2*n - 4*a*d^2)*r^4 + 64*b*d^2*n + 12*(b*d
^2*n - 4*a*d^2)*r^3 - 256*a*d^2 + 52*(b*d^2*n - 4*a*d^2)*r^2 + 96*(b*d^2*n
- 4*a*d^2)*r)*x^4 + 4*(2*(b*e^2*r^3 + 10*b*e^2*r^2 + 32*b*e^2*r + 32*b*e^2)
*x^4*log(c) + 2*(b*e^2*n*r^3 + 10*b*e^2*n*r^2 + 32*b*e^2*n*r + 32*b*e^2*n)*
x^4*log(x) + (2*a*e^2*r^3 - 16*b*e^2*n + 64*a*e^2 - (b*e^2*n - 20*a*e^2)*r^
2 - 8*(b*e^2*n - 8*a*e^2)*r)*x^4)*x^(2*r) + 32*((b*d*e*r^3 + 8*b*d*e*r^2 +
20*b*d*e*r + 16*b*d*e)*x^4*log(c) + (b*d*e*n*r^3 + 8*b*d*e*n*r^2 + 20*b*d*e
*n*r + 16*b*d*e*n)*x^4*log(x) + (a*d*e*r^3 - 4*b*d*e*n + 16*a*d*e - (b*d*e*
n - 8*a*d*e)*r^2 - 4*(b*d*e*n - 5*a*d*e)*r)*x^4)*x^r)/(r^4 + 12*r^3 + 52*r^
2 + 96*r + 64)
```

giac [**B**] time = 0.51, size = 744, normalized size = 7.22

$$\frac{4\,bd^2nr^4x^4\log(x)+32\,bdnr^3x^4x^re\log(x)-bd^2nr^4x^4+4\,bd^2r^4x^4\log(c)+32\,bdr^3x^4x^re\log(c)+48\,bd^2nr^3x^4\log(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/16*(4*b*d^2*n*r^4*x^4*log(x) + 32*b*d*n*r^3*x^4*x^r*e*log(x) - b*d^2*n*r^
4*x^4 + 4*b*d^2*r^4*x^4*log(c) + 32*b*d*r^3*x^4*x^r*e*log(c) + 48*b*d^2*n*r
^3*x^4*log(x) + 8*b*n*r^3*x^4*x^(2*r)*e^2*log(x) + 256*b*d*n*r^2*x^4*x^r*e*
```

```
log(x) - 12*b*d^2*n*r^3*x^4 + 4*a*d^2*r^4*x^4 - 32*b*d*n*r^2*x^4*x^r*e + 32
*a*d*r^3*x^4*x^r*e + 48*b*d^2*r^3*x^4*log(c) + 8*b*r^3*x^4*x^(2*r)*e^2*log(
c) + 256*b*d*r^2*x^4*x^r*e*log(c) + 208*b*d^2*n*r^2*x^4*log(x) + 80*b*n*r^2
*x^4*x^(2*r)*e^2*log(x) + 640*b*d*n*r*x^4*x^r*e*log(x) - 52*b*d^2*n*r^2*x^4
 + 48*a*d^2*r^3*x^4 - 4*b*n*r^2*x^4*x^(2*r)*e^2 + 8*a*r^3*x^4*x^(2*r)*e^2 -
 128*b*d*n*r*x^4*x^r*e + 256*a*d*r^2*x^4*x^r*e + 208*b*d^2*r^2*x^4*log(c) +
 80*b*r^2*x^4*x^(2*r)*e^2*log(c) + 640*b*d*r*x^4*x^r*e*log(c) + 384*b*d^2*n
*r*x^4*log(x) + 256*b*n*r*x^4*x^(2*r)*e^2*log(x) + 512*b*d*n*x^4*x^r*e*log(
x) - 96*b*d^2*n*r*x^4 + 208*a*d^2*r^2*x^4 - 32*b*n*r*x^4*x^(2*r)*e^2 + 80*a
*r^2*x^4*x^(2*r)*e^2 - 128*b*d*n*x^4*x^r*e + 640*a*d*r*x^4*x^r*e + 384*b*d^
2*r*x^4*log(c) + 256*b*r*x^4*x^(2*r)*e^2*log(c) + 512*b*d*x^4*x^r*e*log(c)
+ 256*b*d^2*n*x^4*log(x) + 256*b*n*x^4*x^(2*r)*e^2*log(x) - 64*b*d^2*n*x^4
+ 384*a*d^2*r*x^4 - 64*b*n*x^4*x^(2*r)*e^2 + 256*a*r*x^4*x^(2*r)*e^2 + 512*
a*d*x^4*x^r*e + 256*b*d^2*x^4*log(c) + 256*b*x^4*x^(2*r)*e^2*log(c) + 256*a
*d^2*x^4 + 256*a*x^4*x^(2*r)*e^2)/(r^4 + 12*r^3 + 52*r^2 + 96*r + 64)
```

maple [C] time = 0.34, size = 1924, normalized size = 18.68

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+e*x^r)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/4*b*x^4*(2*e^2*(x^r)^2*r+d^2*r^2+8*d*e*r*x^r+8*(x^r)^2*e^2+6*d^2*r+16*d*e
*x^r+8*d^2)/(r+2)/(r+4)*ln(x^n)-1/16*x^4*(128*I*Pi*b*d*e*r^2*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*x^r+128*I*Pi*b*d^2*csgn(I*c*x^n)^3-256*ln(c)*b*e^2*(x
^r)^2-8*a*e^2*r^3*(x^r)^2-512*a*d*e*x^r-80*a*e^2*r^2*(x^r)^2-256*a*e^2*r*(x
^r)^2+64*b*e^2*n*(x^r)^2-4*b*d^2*r^4*ln(c)-48*b*d^2*r^3*ln(c)-208*b*d^2*r^2
*ln(c)-384*b*d^2*r*ln(c)-256*a*d^2+b*d^2*n*r^4+12*b*d^2*n*r^3+64*b*d^2*n-25
6*a*e^2*(x^r)^2-256*b*d^2*ln(c)-4*a*d^2*r^4+52*b*d^2*n*r^2+96*b*d^2*n*r-208
*a*d^2*r^2-384*a*d^2*r-48*a*d^2*r^3+104*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+320*
I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+192*I*Pi*b*d^2*r*csgn(
I*c*x^n)^3-128*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-128*I*Pi*b*d^2*csgn(I
*c*x^n)^2*csgn(I*c)+2*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3+16*I*Pi*b*d*e*r^3*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+4*b*e^2*n*r^2*(x^r)^2-32*a*d*e*r^3*x^r-
256*a*d*e*r^2*x^r-640*a*d*e*r*x^r+32*b*e^2*n*r*(x^r)^2+128*b*d*e*n*x^r-80*l
n(c)*b*e^2*r^2*(x^r)^2-256*ln(c)*b*e^2*r*(x^r)^2-512*b*d*e*x^r*ln(c)-8*ln(c
)*b*e^2*r^3*(x^r)^2-192*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-104*I*Pi*b
*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^
n)^2-2*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)-128*I*Pi*b*e^2*csgn(I*c*x^n
)^2*csgn(I*c)*(x^r)^2+128*b*d*e*n*r*x^r+32*b*d*e*n*r^2*x^r-256*b*d*e*r^2*x^
r*ln(c)-640*b*d*e*r*x^r*ln(c)-32*b*d*e*r^3*x^r*ln(c)-192*I*Pi*b*d^2*r*csgn(
I*c*x^n)^2*csgn(I*c)+128*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-104
*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+4*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^
3*(x^r)^2-4*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-128*I*Pi*b*e^2
*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-40*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I
*c*x^n)^2*(x^r)^2-4*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+192*
I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+104*I*Pi*b*d^2*r^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+16*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^r+320*I*Pi
*b*d*e*r*csgn(I*c*x^n)^3*x^r+128*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*(x^r)^2-128*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-256*I*Pi*b*
d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-256*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c
)*x^r+2*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+24*I*Pi*b*d^2*r^
3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-40*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csg
n(I*c)*(x^r)^2+128*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^3*x^r-24*I*Pi*b*d^2*r^3*csg
n(I*x^n)*csgn(I*c*x^n)^2-24*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)+256*I*
Pi*b*d*e*csgn(I*c*x^n)^3*x^r+40*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2+24*I
*Pi*b*d^2*r^3*csgn(I*c*x^n)^3+128*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+128*I*
Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-128*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)
^2*(x^r)^2+40*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-12
```

```
8*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-16*I*Pi*b*d*e*r^3*csgn(I*x
^n)*csgn(I*c*x^n)^2*x^r-16*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+4*I
*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+256*I*Pi*b*d*e*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-128*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*cs
gn(I*c)*x^r+128*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-32
0*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-320*I*Pi*b*d*e*r*csgn(I*c*x^
n)^2*csgn(I*c)*x^r)/(r+2)^2/(r+4)^2
```

maxima [A] time = 1.00, size = 148, normalized size = 1.44

$$-\frac{1}{16}bd^2nx^4+\frac{1}{4}bd^2x^4\log(cx^n)+\frac{1}{4}ad^2x^4+\frac{be^2x^{2r+4}\log(cx^n)}{2(r+2)}+\frac{2bdex^{r+4}\log(cx^n)}{r+4}-\frac{be^2nx^{2r+4}}{4(r+2)^2}+\frac{ae^2x^{2r+4}}{2(r+2)}-\frac{2bdenx}{(r+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/16*b*d^2*n*x^4 + 1/4*b*d^2*x^4*log(c*x^n) + 1/4*a*d^2*x^4 + 1/2*b*e^2*x^
(2*r + 4)*log(c*x^n)/(r + 2) + 2*b*d*e*x^(r + 4)*log(c*x^n)/(r + 4) - 1/4*b
*e^2*n*x^(2*r + 4)/(r + 2)^2 + 1/2*a*e^2*x^(2*r + 4)/(r + 2) - 2*b*d*e*n*x^
(r + 4)/(r + 4)^2 + 2*a*d*e*x^(r + 4)/(r + 4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^3\,(d+e\,x^r)^2\,\left(a+b\,\ln(c\,x^n)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d + e*x^r)^2*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^3*(d + e*x^r)^2*(a + b*log(c*x^n)), x)
```

sympy [A] time = 116.28, size = 2162, normalized size = 20.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((a*d**2*x**4/4 + 2*a*d*e*log(x) - a*e**2/(4*x**4) + b*d**2*n*x**4
*log(x)/4 - b*d**2*n*x**4/16 + b*d**2*x**4*log(c)/4 + b*d*e*n*log(x)**2 + 2
*b*d*e*log(c)*log(x) - b*e**2*n*log(x)/(4*x**4) - b*e**2*n/(16*x**4) - b*e*
*2*log(c)/(4*x**4), Eq(r, -4)), (a*d**2*x**4/4 + a*d*e*x**2 + a*e**2*log(x)
 + b*d**2*n*x**4*log(x)/4 - b*d**2*n*x**4/16 + b*d**2*x**4*log(c)/4 + b*d*e
*n*x**2*log(x) - b*d*e*n*x**2/2 + b*d*e*x**2*log(c) + b*e**2*n*log(x)**2/2
+ b*e**2*log(c)*log(x), Eq(r, -2)), (4*a*d**2*r**4*x**4/(16*r**4 + 192*r**3
 + 832*r**2 + 1536*r + 1024) + 48*a*d**2*r**3*x**4/(16*r**4 + 192*r**3 + 83
2*r**2 + 1536*r + 1024) + 208*a*d**2*r**2*x**4/(16*r**4 + 192*r**3 + 832*r*
*2 + 1536*r + 1024) + 384*a*d**2*r*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 15
36*r + 1024) + 256*a*d**2*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 10
24) + 32*a*d*e*r**3*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 102
4) + 256*a*d*e*r**2*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 102
4) + 640*a*d*e*r*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024)
+ 512*a*d*e*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 8*a
*e**2*r**3*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) +
80*a*e**2*r**2*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024
) + 256*a*e**2*r*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 10
24) + 256*a*e**2*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 10
24) + 4*b*d**2*n*r**4*x**4*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r +
 1024) - b*d**2*n*r**4*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024)
```

```
 + 48*b*d**2*n*r**3*x**4*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1
024) - 12*b*d**2*n*r**3*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024
) + 208*b*d**2*n*r**2*x**4*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r +
 1024) - 52*b*d**2*n*r**2*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 10
24) + 384*b*d**2*n*r*x**4*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r +
1024) - 96*b*d**2*n*r*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024)
+ 256*b*d**2*n*x**4*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024)
- 64*b*d**2*n*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 4*b*d*
*2*r**4*x**4*log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 48*b*
d**2*r**3*x**4*log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 208
*b*d**2*r**2*x**4*log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) +
384*b*d**2*r*x**4*log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) +
256*b*d**2*x**4*log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 32
*b*d*e*n*r**3*x**4*x**r*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 10
24) + 256*b*d*e*n*r**2*x**4*x**r*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 15
36*r + 1024) - 32*b*d*e*n*r**2*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**2 + 1
536*r + 1024) + 640*b*d*e*n*r*x**4*x**r*log(x)/(16*r**4 + 192*r**3 + 832*r*
*2 + 1536*r + 1024) - 128*b*d*e*n*r*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**
2 + 1536*r + 1024) + 512*b*d*e*n*x**4*x**r*log(x)/(16*r**4 + 192*r**3 + 832
*r**2 + 1536*r + 1024) - 128*b*d*e*n*x**4*x**r/(16*r**4 + 192*r**3 + 832*r*
*2 + 1536*r + 1024) + 32*b*d*e*r**3*x**4*x**r*log(c)/(16*r**4 + 192*r**3 +
832*r**2 + 1536*r + 1024) + 256*b*d*e*r**2*x**4*x**r*log(c)/(16*r**4 + 192*
r**3 + 832*r**2 + 1536*r + 1024) + 640*b*d*e*r*x**4*x**r*log(c)/(16*r**4 +
192*r**3 + 832*r**2 + 1536*r + 1024) + 512*b*d*e*x**4*x**r*log(c)/(16*r**4
+ 192*r**3 + 832*r**2 + 1536*r + 1024) + 8*b*e**2*n*r**3*x**4*x**(2*r)*log(
x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 80*b*e**2*n*r**2*x**4*
x**(2*r)*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) - 4*b*e**2*
n*r**2*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 256*
b*e**2*n*r*x**4*x**(2*r)*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1
024) - 32*b*e**2*n*r*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r
+ 1024) + 256*b*e**2*n*x**4*x**(2*r)*log(x)/(16*r**4 + 192*r**3 + 832*r**2
+ 1536*r + 1024) - 64*b*e**2*n*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2
 + 1536*r + 1024) + 8*b*e**2*r**3*x**4*x**(2*r)*log(c)/(16*r**4 + 192*r**3
+ 832*r**2 + 1536*r + 1024) + 80*b*e**2*r**2*x**4*x**(2*r)*log(c)/(16*r**4
+ 192*r**3 + 832*r**2 + 1536*r + 1024) + 256*b*e**2*r*x**4*x**(2*r)*log(c)/
(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 256*b*e**2*x**4*x**(2*r)*
log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024), True))
```

3.381 $\int x\left(d+ex^r\right)^2\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=102

$$\frac{1}{2}\left(d^2x^2+\frac{4dex^{r+2}}{r+2}+\frac{e^2x^{2(r+1)}}{r+1}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bd^2nx^2-\frac{2bdenx^{r+2}}{(r+2)^2}-\frac{be^2nx^{2(r+1)}}{4(r+1)^2}$$

```
[Out] -1/4*b*d^2*n*x^2-1/4*b*e^2*n*x^(2+2*r)/(1+r)^2-2*b*d*e*n*x^(2+r)/(2+r)^2+1/
2*(d^2*x^2+e^2*x^(2+2*r)/(1+r)+4*d*e*x^(2+r)/(2+r))*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.13, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {270, 2334, 12, 14}

$$\frac{1}{2}\left(d^2x^2+\frac{4dex^{r+2}}{r+2}+\frac{e^2x^{2(r+1)}}{r+1}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bd^2nx^2-\frac{2bdenx^{r+2}}{(r+2)^2}-\frac{be^2nx^{2(r+1)}}{4(r+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^2)/4 - (b*e^2*n*x^(2*(1 + r)))/(4*(1 + r)^2) - (2*b*d*e*n*x^(2
+ r))/(2 + r)^2 + ((d^2*x^2 + (e^2*x^(2*(1 + r)))/(1 + r) + (4*d*e*x^(2 + r
))/(2 + r))*(a + b*Log[c*x^n]))/2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x\left(d+ex^r\right)^2\left(a+b\log\left(cx^n\right)\right)dx=\frac{1}{2}\left(d^2x^2+\frac{e^2x^{2(1+r)}}{1+r}+\frac{4dex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{2}x\left(d^2+\frac{4dex}{2+}\right.$$
$$=\frac{1}{2}\left(d^2x^2+\frac{e^2x^{2(1+r)}}{1+r}+\frac{4dex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int x\left(d^2+\frac{4dex}{2+}\right.$$
$$=\frac{1}{2}\left(d^2x^2+\frac{e^2x^{2(1+r)}}{1+r}+\frac{4dex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int\left(d^2x+\frac{4dex}{2+}\right.$$
$$=-\frac{1}{4}bd^2nx^2-\frac{be^2nx^{2(1+r)}}{4(1+r)^2}-\frac{2bdenx^{2+r}}{(2+r)^2}+\frac{1}{2}\left(d^2x^2+\frac{e^2x^{2(1+r)}}{1+r}+\frac{4dex^{2+r}}{2+r}\right)$$

Mathematica [A] time = 0.24, size = 116, normalized size = 1.14

$$\frac{1}{4}x^2\left(2a\left(d^2+\frac{4dex^r}{r+2}+\frac{e^2x^{2r}}{r+1}\right)+2b\log\left(cx^n\right)\left(d^2+\frac{4dex^r}{r+2}+\frac{e^2x^{2r}}{r+1}\right)+bn\left(-d^2-\frac{8dex^r}{(r+2)^2}-\frac{e^2x^{2r}}{(r+1)^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(b*n*(-d^2 - (8*d*e*x^r)/(2 + r)^2 - (e^2*x^(2*r))/(1 + r)^2) + 2*a*(d
^2 + (4*d*e*x^r)/(2 + r) + (e^2*x^(2*r))/(1 + r)) + 2*b*(d^2 + (4*d*e*x^r)/
(2 + r) + (e^2*x^(2*r))/(1 + r))*Log[c*x^n]))/4
```

fricas [B] time = 0.49, size = 488, normalized size = 4.78

$$\frac{2\left(bd^2r^4+6\,bd^2r^3+13\,bd^2r^2+12\,bd^2r+4\,bd^2\right)x^2\log(c)+2\left(bd^2nr^4+6\,bd^2nr^3+13\,bd^2nr^2+12\,bd^2nr+4\,bd\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*(b*d^2*r^4 + 6*b*d^2*r^3 + 13*b*d^2*r^2 + 12*b*d^2*r + 4*b*d^2)*x^2*
log(c) + 2*(b*d^2*n*r^4 + 6*b*d^2*n*r^3 + 13*b*d^2*n*r^2 + 12*b*d^2*n*r + 4
*b*d^2*n)*x^2*log(x) - ((b*d^2*n - 2*a*d^2)*r^4 + 4*b*d^2*n + 6*(b*d^2*n -
2*a*d^2)*r^3 - 8*a*d^2 + 13*(b*d^2*n - 2*a*d^2)*r^2 + 12*(b*d^2*n - 2*a*d^2
)*r)*x^2 + (2*(b*e^2*r^3 + 5*b*e^2*r^2 + 8*b*e^2*r + 4*b*e^2)*x^2*log(c) +
2*(b*e^2*n*r^3 + 5*b*e^2*n*r^2 + 8*b*e^2*n*r + 4*b*e^2*n)*x^2*log(x) + (2*a
*e^2*r^3 - 4*b*e^2*n + 8*a*e^2 - (b*e^2*n - 10*a*e^2)*r^2 - 4*(b*e^2*n - 4*
a*e^2)*r)*x^2)*x^(2*r) + 8*((b*d*e*r^3 + 4*b*d*e*r^2 + 5*b*d*e*r + 2*b*d*e)
*x^2*log(c) + (b*d*e*n*r^3 + 4*b*d*e*n*r^2 + 5*b*d*e*n*r + 2*b*d*e*n)*x^2*l
og(x) + (a*d*e*r^3 - b*d*e*n + 2*a*d*e - (b*d*e*n - 4*a*d*e)*r^2 - (2*b*d*e
*n - 5*a*d*e)*r)*x^2)*x^r)/(r^4 + 6*r^3 + 13*r^2 + 12*r + 4)
```

giac [B] time = 0.44, size = 744, normalized size = 7.29

$$\frac{2\,bd^2nr^4x^2\log(x)+8\,bdnr^3x^2x^re\log(x)-bd^2nr^4x^2+2\,bd^2r^4x^2\log(c)+8\,bdr^3x^2x^re\log(c)+12\,bd^2nr^3x^2\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/4*(2*b*d^2*n*r^4*x^2*log(x) + 8*b*d*n*r^3*x^2*x^r*e*log(x) - b*d^2*n*r^4*
x^2 + 2*b*d^2*r^4*x^2*log(c) + 8*b*d*r^3*x^2*x^r*e*log(c) + 12*b*d^2*n*r^3*
x^2*log(x) + 2*b*n*r^3*x^2*x^(2*r)*e^2*log(x) + 32*b*d*n*r^2*x^2*x^r*e*log(
x) - 6*b*d^2*n*r^3*x^2 + 2*a*d^2*r^4*x^2 - 8*b*d*n*r^2*x^2*x^r*e + 8*a*d*r^
```

```
3*x^2*x^r*e + 12*b*d^2*r^3*x^2*log(c) + 2*b*r^3*x^2*x^(2*r)*e^2*log(c) + 32
*b*d*r^2*x^2*x^r*e*log(c) + 26*b*d^2*n*r^2*x^2*log(x) + 10*b*n*r^2*x^2*x^(2
*r)*e^2*log(x) + 40*b*d*n*r*x^2*x^r*e*log(x) - 13*b*d^2*n*r^2*x^2 + 12*a*d^
2*r^3*x^2 - b*n*r^2*x^2*x^(2*r)*e^2 + 2*a*r^3*x^2*x^(2*r)*e^2 - 16*b*d*n*r*
x^2*x^r*e + 32*a*d*r^2*x^2*x^r*e + 26*b*d^2*r^2*x^2*log(c) + 10*b*r^2*x^2*x
^(2*r)*e^2*log(c) + 40*b*d*r*x^2*x^r*e*log(c) + 24*b*d^2*n*r*x^2*log(x) + 1
6*b*n*r*x^2*x^(2*r)*e^2*log(x) + 16*b*d*n*x^2*x^r*e*log(x) - 12*b*d^2*n*r*x
^2 + 26*a*d^2*r^2*x^2 - 4*b*n*r*x^2*x^(2*r)*e^2 + 10*a*r^2*x^2*x^(2*r)*e^2
- 8*b*d*n*x^2*x^r*e + 40*a*d*r*x^2*x^r*e + 24*b*d^2*r*x^2*log(c) + 16*b*r*x
^2*x^(2*r)*e^2*log(c) + 16*b*d*x^2*x^r*e*log(c) + 8*b*d^2*n*x^2*log(x) + 8*
b*n*x^2*x^(2*r)*e^2*log(x) - 4*b*d^2*n*x^2 + 24*a*d^2*r*x^2 - 4*b*n*x^2*x^(
2*r)*e^2 + 16*a*r*x^2*x^(2*r)*e^2 + 16*a*d*x^2*x^r*e + 8*b*d^2*x^2*log(c) +
 8*b*x^2*x^(2*r)*e^2*log(c) + 8*a*d^2*x^2 + 8*a*x^2*x^(2*r)*e^2)/(r^4 + 6*r
^3 + 13*r^2 + 12*r + 4)
```

maple [C] time = 0.35, size = 1922, normalized size = 18.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+e*x^r)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/2*b*x^2*(e^2*(x^r)^2*r+d^2*r^2+4*d*e*r*x^r+2*(x^r)^2*e^2+3*d^2*r+4*d*e*x^
r+2*d^2)/(r+1)/(r+2)*ln(x^n)-1/4*x^2*(4*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)*x^r-8*ln(c)*b*e^2*(x^r)^2-2*a*e^2*r^3*(x^r)^2-16*a*d*e*x^r-
10*a*e^2*r^2*(x^r)^2-16*a*e^2*r*(x^r)^2+4*b*e^2*n*(x^r)^2-2*b*d^2*r^4*ln(c)
-12*b*d^2*r^3*ln(c)-26*b*d^2*r^2*ln(c)-24*b*d^2*r*ln(c)-8*a*d^2+b*d^2*n*r^4
+6*b*d^2*n*r^3+4*b*d^2*n-8*a*e^2*(x^r)^2-16*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*
csgn(I*c)*x^r-8*b*d^2*ln(c)-2*a*d^2*r^4+13*b*d^2*n*r^2+12*b*d^2*n*r-26*a*d^
2*r^2-24*a*d^2*r-12*a*d^2*r^3+13*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+12*I*Pi*b*d
^2*r*csgn(I*c*x^n)^3-4*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-4*I*Pi*b*d^2*
csgn(I*c*x^n)^2*csgn(I*c)+6*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^3+4*I*Pi*b*e^2*csg
n(I*c*x^n)^3*(x^r)^2+16*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
x^r+20*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+b*e^2*n*r^2*(x^
r)^2-8*a*d*e*r^3*x^r-32*a*d*e*r^2*x^r-40*a*d*e*r*x^r+4*b*e^2*n*r*(x^r)^2+8*
b*d*e*n*x^r-10*ln(c)*b*e^2*r^2*(x^r)^2-16*ln(c)*b*e^2*r*(x^r)^2-16*b*d*e*x^
r*ln(c)-2*ln(c)*b*e^2*r^3*(x^r)^2+I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-6*
I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)+16*b*d*e*n*r*x^r+8*b*d*e*n*r^2*x^r
-32*b*d*e*r^2*x^r*ln(c)-40*b*d*e*r*x^r*ln(c)-8*b*d*e*r^3*x^r*ln(c)+4*I*Pi*b
*d^2*csgn(I*c*x^n)^3+I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*I
*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+6*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)-5*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+16*I*P
i*b*d*e*r^2*csgn(I*c*x^n)^3*x^r-8*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*
(x^r)^2-5*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-I*Pi*b*e^2*r^3
*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+12*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+13*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*
e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+4*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*
x^r+20*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r+4*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)*(x^r)^2-8*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-8*I*
Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-13*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*
csgn(I*c)-I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d^2*r^4*csgn(I*
c*x^n)^2*csgn(I*c)-6*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-4*I*Pi*b*e^
2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-12*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^
n)^2-12*I*Pi*b*d^2*r*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*e^2*r^3*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*(x^r)^2+8*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*x^r+I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3+8*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+5*
I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2+8*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)
^2-4*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+8*I*Pi*b*e^2*r*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-20*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^
n)^2*x^r-20*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+5*I*Pi*b*e^2*r^2*csg
```

```
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-16*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn
(I*c*x^n)^2*x^r-4*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-4*I*Pi*b*d
*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+4*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-13*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2)/(r+1)^2/(r+2)^2
```

maxima [A] time = 1.00, size = 148, normalized size = 1.45

$$-\frac{1}{4}\,bd^2nx^2+\frac{1}{2}\,bd^2x^2\log\left(cx^n\right)+\frac{1}{2}\,ad^2x^2+\frac{be^2x^{2\,r+2}\log\left(cx^n\right)}{2\,(r+1)}+\frac{2\,bdex^{r+2}\log\left(cx^n\right)}{r+2}-\frac{be^2nx^{2\,r+2}}{4\,(r+1)^2}+\frac{ae^2x^{2\,r+2}}{2\,(r+1)}-\frac{2\,bde\ldots}{(r+\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/4*b*d^2*n*x^2 + 1/2*b*d^2*x^2*log(c*x^n) + 1/2*a*d^2*x^2 + 1/2*b*e^2*x^(
2*r + 2)*log(c*x^n)/(r + 1) + 2*b*d*e*x^(r + 2)*log(c*x^n)/(r + 2) - 1/4*b*
e^2*n*x^(2*r + 2)/(r + 1)^2 + 1/2*a*e^2*x^(2*r + 2)/(r + 1) - 2*b*d*e*n*x^(
r + 2)/(r + 2)^2 + 2*a*d*e*x^(r + 2)/(r + 2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,(d+e\,x^r)^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d + e*x^r)^2*(a + b*log(c*x^n)),x)
```

```
[Out] int(x*(d + e*x^r)^2*(a + b*log(c*x^n)), x)
```

sympy [A] time = 18.57, size = 2159, normalized size = 21.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((a*d**2*x**2/2 + 2*a*d*e*log(x) - a*e**2/(2*x**2) + b*d**2*n*x**2
*log(x)/2 - b*d**2*n*x**2/4 + b*d**2*x**2*log(c)/2 + b*d*e*n*log(x)**2 + 2*
b*d*e*log(c)*log(x) - b*e**2*n*log(x)/(2*x**2) - b*e**2*n/(4*x**2) - b*e**2
*log(c)/(2*x**2), Eq(r, -2)), (a*d**2*x**2/2 + 2*a*d*e*x + a*e**2*log(x) +
b*d**2*n*x**2*log(x)/2 - b*d**2*n*x**2/4 + b*d**2*x**2*log(c)/2 + 2*b*d*e*n
*x*log(x) - 2*b*d*e*n*x + 2*b*d*e*x*log(c) + b*e**2*n*log(x)**2/2 + b*e**2*
log(c)*log(x), Eq(r, -1)), (2*a*d**2*r**4*x**2/(4*r**4 + 24*r**3 + 52*r**2
+ 48*r + 16) + 12*a*d**2*r**3*x**2/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16)
 + 26*a*d**2*r**2*x**2/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 24*a*d**2
*r*x**2/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 8*a*d**2*x**2/(4*r**4 +
24*r**3 + 52*r**2 + 48*r + 16) + 8*a*d*e*r**3*x**2*x**r/(4*r**4 + 24*r**3 +
 52*r**2 + 48*r + 16) + 32*a*d*e*r**2*x**2*x**r/(4*r**4 + 24*r**3 + 52*r**2
 + 48*r + 16) + 40*a*d*e*r*x**2*x**r/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 1
6) + 16*a*d*e*x**2*x**r/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 2*a*e**2
*r**3*x**2*x**(2*r)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 10*a*e**2*r*
*2*x**2*x**(2*r)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 16*a*e**2*r*x**
2*x**(2*r)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 8*a*e**2*x**2*x**(2*r
)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 2*b*d**2*n*r**4*x**2*log(x)/(4
*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - b*d**2*n*r**4*x**2/(4*r**4 + 24*r*
*3 + 52*r**2 + 48*r + 16) + 12*b*d**2*n*r**3*x**2*log(x)/(4*r**4 + 24*r**3
+ 52*r**2 + 48*r + 16) - 6*b*d**2*n*r**3*x**2/(4*r**4 + 24*r**3 + 52*r**2 +
 48*r + 16) + 26*b*d**2*n*r**2*x**2*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48
*r + 16) - 13*b*d**2*n*r**2*x**2/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) +
 24*b*d**2*n*r*x**2*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - 12*b*
```

```
d**2*n*r*x**2/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 8*b*d**2*n*x**2*lo
g(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - 4*b*d**2*n*x**2/(4*r**4 + 2
4*r**3 + 52*r**2 + 48*r + 16) + 2*b*d**2*r**4*x**2*log(c)/(4*r**4 + 24*r**3
 + 52*r**2 + 48*r + 16) + 12*b*d**2*r**3*x**2*log(c)/(4*r**4 + 24*r**3 + 52
*r**2 + 48*r + 16) + 26*b*d**2*r**2*x**2*log(c)/(4*r**4 + 24*r**3 + 52*r**2
 + 48*r + 16) + 24*b*d**2*r*x**2*log(c)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r
+ 16) + 8*b*d**2*x**2*log(c)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 8*b
*d*e*n*r**3*x**2*x**r*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 32*
b*d*e*n*r**2*x**2*x**r*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - 8*
b*d*e*n*r**2*x**2*x**r/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 40*b*d*e*
n*r*x**2*x**r*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - 16*b*d*e*n*
r*x**2*x**r/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 16*b*d*e*n*x**2*x**r
*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - 8*b*d*e*n*x**2*x**r/(4*r
**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 8*b*d*e*r**3*x**2*x**r*log(c)/(4*r**
4 + 24*r**3 + 52*r**2 + 48*r + 16) + 32*b*d*e*r**2*x**2*x**r*log(c)/(4*r**4
 + 24*r**3 + 52*r**2 + 48*r + 16) + 40*b*d*e*r*x**2*x**r*log(c)/(4*r**4 + 2
4*r**3 + 52*r**2 + 48*r + 16) + 16*b*d*e*x**2*x**r*log(c)/(4*r**4 + 24*r**3
 + 52*r**2 + 48*r + 16) + 2*b*e**2*n*r**3*x**2*x**(2*r)*log(x)/(4*r**4 + 24
*r**3 + 52*r**2 + 48*r + 16) + 10*b*e**2*n*r**2*x**2*x**(2*r)*log(x)/(4*r**
4 + 24*r**3 + 52*r**2 + 48*r + 16) - b*e**2*n*r**2*x**2*x**(2*r)/(4*r**4 +
24*r**3 + 52*r**2 + 48*r + 16) + 16*b*e**2*n*r*x**2*x**(2*r)*log(x)/(4*r**4
 + 24*r**3 + 52*r**2 + 48*r + 16) - 4*b*e**2*n*r*x**2*x**(2*r)/(4*r**4 + 24
*r**3 + 52*r**2 + 48*r + 16) + 8*b*e**2*n*x**2*x**(2*r)*log(x)/(4*r**4 + 24
*r**3 + 52*r**2 + 48*r + 16) - 4*b*e**2*n*x**2*x**(2*r)/(4*r**4 + 24*r**3 +
 52*r**2 + 48*r + 16) + 2*b*e**2*r**3*x**2*x**(2*r)*log(c)/(4*r**4 + 24*r**
3 + 52*r**2 + 48*r + 16) + 10*b*e**2*r**2*x**2*x**(2*r)*log(c)/(4*r**4 + 24
*r**3 + 52*r**2 + 48*r + 16) + 16*b*e**2*r*x**2*x**(2*r)*log(c)/(4*r**4 + 2
4*r**3 + 52*r**2 + 48*r + 16) + 8*b*e**2*x**2*x**(2*r)*log(c)/(4*r**4 + 24*
r**3 + 52*r**2 + 48*r + 16), True))
```

3.382 $\int \frac{(d+ex^r)^2\left(a+b\log(cx^n)\right)}{x}\,dx$

Optimal. Leaf size=104

$$d^2\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{2dex^r\left(a+b\log\left(cx^n\right)\right)}{r}+\frac{e^2x^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r}-\frac{1}{2}bd^2n\log^2(x)-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}$$

```
[Out] -2*b*d*e*n*x^r/r^2-1/4*b*e^2*n*x^(2*r)/r^2-1/2*b*d^2*n*ln(x)^2+2*d*e*x^r*(a
+b*ln(c*x^n))/r+1/2*e^2*x^(2*r)*(a+b*ln(c*x^n))/r+d^2*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.13, antiderivative size = 87, normalized size of antiderivative = 0.84, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$\frac{1}{2}\left(2d^2\log(x)+\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^2n\log^2(x)-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-2*b*d*e*n*x^r)/r^2 - (b*e^2*n*x^(2*r))/(4*r^2) - (b*d^2*n*Log[x]^2)/2 + (
((4*d*e*x^r)/r + (e^2*x^(2*r))/r + 2*d^2*Log[x])*(a + b*Log[c*x^n]))/2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] && !(EqQ[q, 1
```

```
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^2 \left(a+b\log\left(cx^n\right)\right)}{x}dx = \frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{ex^r(4d+ex^r)+2d}{2rx}$$

$$=\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int \frac{ex^r(4d+ex^r)+2d^2r\log(x)}{x}}{2r}$$

$$=\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int\left(4dex^{-1+r}+e^2x^{-1+}\right.}{2r}$$

$$=-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}+\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(b$$

$$=-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}-\frac{1}{2}bd^2n\log^2(x)+\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)(a+$$

Mathematica [A] time = 0.22, size = 90, normalized size = 0.87

$$\frac{1}{4}\left(\frac{ex^r(2ar(4d+ex^r)-bn(8d+ex^r))}{r^2}+4ad^2\log(x)+\frac{2bd^2\log^2(cx^n)}{n}+\frac{2bex^r\log(cx^n)(4d+ex^r)}{r}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] ((e*x^r*(2*a*r*(4*d + e*x^r) - b*n*(8*d + e*x^r)))/r^2 + 4*a*d^2*Log[x] + (
2*b*e*x^r*(4*d + e*x^r)*Log[c*x^n])/r + (2*b*d^2*Log[c*x^n]^2)/n)/4
```

fricas [A] time = 0.48, size = 115, normalized size = 1.11

$$\frac{2\,bd^2nr^2\log(x)^2+\left(2\,be^2nr\log(x)+2\,be^2r\log(c)-be^2n+2\,ae^2r\right)x^{2\,r}+8\left(bdenr\log(x)+bder\log(c)-bden+ad\right.}{4\,r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*d^2*n*r^2*log(x)^2 + (2*b*e^2*n*r*log(x) + 2*b*e^2*r*log(c) - b*e^
2*n + 2*a*e^2*r)*x^(2*r) + 8*(b*d*e*n*r*log(x) + b*d*e*r*log(c) - b*d*e*n +
 a*d*e*r)*x^r + 4*(b*d^2*r^2*log(c) + a*d^2*r^2)*log(x))/r^2
```

giac [A] time = 0.43, size = 140, normalized size = 1.35

$$\frac{1}{2}\,bd^2n\log(x)^2+\frac{2\,bdnx^re\log(x)}{r}+bd^2\log(c)\log(x)+\frac{2\,bdx^re\log(c)}{r}+ad^2\log(x)+\frac{bnx^{2\,r}e^2\log(x)}{2\,r}-\frac{2\,bdnx^re}{r^2}+\frac{2\,adx}{r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d^2*n*log(x)^2 + 2*b*d*n*x^r*e*log(x)/r + b*d^2*log(c)*log(x) + 2*b*d
*x^r*e*log(c)/r + a*d^2*log(x) + 1/2*b*n*x^(2*r)*e^2*log(x)/r - 2*b*d*n*x^r
*e/r^2 + 2*a*d*x^r*e/r + 1/2*b*x^(2*r)*e^2*log(c)/r - 1/4*b*n*x^(2*r)*e^2/r
^2 + 1/2*a*x^(2*r)*e^2/r
```

maple [C] time = 0.26, size = 487, normalized size = 4.68

$$-\frac{i\pi b\,d^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln(x)}{2}+\frac{i\pi b\,d^2\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2\ln(x)}{2}+\frac{i\pi b\,d^2\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] 1/2*b*(2*d^2*ln(x)*r+(x^r)^2*e^2+4*d*e*x^r)/r*ln(x^n)-1/4*I/r*Pi*b*e^2*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+1/4*I/r*Pi*b*e^2*csgn(I*x^n)*csgn(I
*c*x^n)^2*(x^r)^2-1/4*I/r*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+1/2*I*Pi*ln(x)*b
*d^2*csgn(I*c*x^n)^2*csgn(I*c)-I/r*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*x^r-I/r*Pi*b*d*e*csgn(I*c*x^n)^3*x^r-1/2*I*Pi*ln(x)*b*d^2*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)+I/r*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+1/2*I*
Pi*ln(x)*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*Pi*ln(x)*b*d^2*csgn(I*c*x^
n)^3+I/r*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+1/4*I/r*Pi*b*e^2*csgn(I*c*x
^n)^2*csgn(I*c)*(x^r)^2-1/2*b*d^2*n*ln(x)^2+1/2/r*ln(c)*b*e^2*(x^r)^2+b*d^2
*ln(c)*ln(x)+1/2/r*a*e^2*(x^r)^2-1/4/r^2*b*e^2*n*(x^r)^2+2/r*b*d*e*x^r*ln(c
)+a*d^2*ln(x)+2/r*a*d*e*x^r-2*b*d*e*n*x^r/r^2
```

maxima [A] time = 0.99, size = 114, normalized size = 1.10

$$\frac{be^2x^{2\,r}\log\left(cx^n\right)}{2\,r}+\frac{2\,bdex^r\log\left(cx^n\right)}{r}+\frac{bd^2\log\left(cx^n\right)^2}{2\,n}+ad^2\log(x)-\frac{be^2nx^{2\,r}}{4\,r^2}+\frac{ae^2x^{2\,r}}{2\,r}-\frac{2\,bdenx^r}{r^2}+\frac{2\,adex^r}{r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] 1/2*b*e^2*x^(2*r)*log(c*x^n)/r + 2*b*d*e*x^r*log(c*x^n)/r + 1/2*b*d^2*log(c
*x^n)^2/n + a*d^2*log(x) - 1/4*b*e^2*n*x^(2*r)/r^2 + 1/2*a*e^2*x^(2*r)/r -
2*b*d*e*n*x^r/r^2 + 2*a*d*e*x^r/r
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(d+e\,x^r\right)}^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x,x)
```

```
[Out] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x, x)
```

sympy [A] time = 14.00, size = 199, normalized size = 1.91

$$\begin{cases} ad^2\log\left(x\right)+\frac{2adex^r}{r}+\frac{ae^2x^{2r}}{2r}+\frac{bd^2n\log\left(x\right)^2}{2}+bd^2\log\left(c\right)\log\left(x\right)+\frac{2bdenx^r\log\left(x\right)}{r}-\frac{2bdenx^r}{r^2}+\frac{2bdex^r\log\left(c\right)}{r}+\frac{be^2nx^{2r}\log}{2r} \\ \left(d+e\right)^2\left(\begin{cases} a\log\left(x\right) & \text{for}\: b=0 \\ -\left(-a-b\log\left(c\right)\right)\log\left(x\right) & \text{for}\: n=0 \\ \frac{\left(-a-b\log\left(cx^n\right)\right)^2}{2bn} & \text{otherwise} \end{cases}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Piecewise((a*d**2*log(x) + 2*a*d*e*x**r/r + a*e**2*x**(2*r)/(2*r) + b*d**2*
n*log(x)**2/2 + b*d**2*log(c)*log(x) + 2*b*d*e*n*x**r*log(x)/r - 2*b*d*e*n*
```

```
x**r/r**2 + 2*b*d*e*x**r*log(c)/r + b*e**2*n*x**(2*r)*log(x)/(2*r) - b*e**2
*n*x**(2*r)/(4*r**2) + b*e**2*x**(2*r)*log(c)/(2*r), Ne(r, 0)), ((d + e)**2
*Piecewise((a*log(x), Eq(b, 0)), (-(-a - b*log(c))*log(x), Eq(n, 0)), ((-a
- b*log(c*x**n))**2/(2*b*n), True)), True))
```

3.383 $\int \frac{(d+ex^r)^2\left(a+b\log(cx^n)\right)}{x^3}\,dx$

Optimal. Leaf size=135

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{2dex^{r-2}\left(a+b\log\left(cx^n\right)\right)}{2-r}-\frac{e^2x^{-2(1-r)}\left(a+b\log\left(cx^n\right)\right)}{2(1-r)}-\frac{bd^2n}{4x^2}-\frac{2bdenx^{r-2}}{(2-r)^2}-\frac{be^2nx^{-2(1-r)}}{4(1-r)^2}$$

```
[Out] -1/4*b*d^2*n/x^2-1/4*b*e^2*n/(1-r)^2/(x^(2-2*r))-2*b*d*e*n*x^(-2+r)/(2-r)^2
-1/2*d^2*(a+b*ln(c*x^n))/x^2-1/2*e^2*(a+b*ln(c*x^n))/(1-r)/(x^(2-2*r))-2*d*
e*x^(-2+r)*(a+b*ln(c*x^n))/(2-r)
```

Rubi [A] time = 0.16, antiderivative size = 114, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{4dex^{r-2}}{2-r}+\frac{e^2x^{-2(1-r)}}{1-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{4x^2}-\frac{2bdenx^{r-2}}{(2-r)^2}-\frac{be^2nx^{-2(1-r)}}{4(1-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d^2*n)/(4*x^2) - (b*e^2*n)/(4*(1 - r)^2*x^(2*(1 - r))) - (2*b*d*e*n*x^(
-2 + r))/(2 - r)^2 - ((d^2/x^2 + e^2/((1 - r)*x^(2*(1 - r))) + (4*d*e*x^(-2
 + r))/(2 - r))*(a + b*Log[c*x^n]))/2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^2\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx = -\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{e^2x^{-2(1-r)}}{1-r}+\frac{4dex^{-2+r}}{2-r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-d^2\left(2-3r+r^2\right.}{}$$

$$= -\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{e^2x^{-2(1-r)}}{1-r}+\frac{4dex^{-2+r}}{2-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int \frac{-d^2\left(2-3r+r^2\right)+4de(-1}{x^3}}{2\left(2-3r+\right.}$$

$$= -\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{e^2x^{-2(1-r)}}{1-r}+\frac{4dex^{-2+r}}{2-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int\left(-\frac{d^2(-2+r)(-1+r)}{x^3}+\right.}{}$$

$$= -\frac{bd^2n}{4x^2}-\frac{be^2nx^{-2(1-r)}}{4(1-r)^2}-\frac{2bdenx^{-2+r}}{(2-r)^2}-\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{e^2x^{-2(1-r)}}{1-r}+\frac{4dex^{-2+r}}{2-r}\right)\left(a+b\right.$$

Mathematica [A] time = 0.32, size = 120, normalized size = 0.89

$$\frac{a\left(-2d^2+\frac{8dex^r}{r-2}+\frac{2e^2x^{2r}}{r-1}\right)+2b\log\left(cx^n\right)\left(-d^2+\frac{4dex^r}{r-2}+\frac{e^2x^{2r}}{r-1}\right)+bn\left(-d^2-\frac{8dex^r}{(r-2)^2}-\frac{e^2x^{2r}}{(r-1)^2}\right)}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] (b*n*(-d^2 - (8*d*e*x^r)/(-2 + r)^2 - (e^2*x^(2*r))/(-1 + r)^2) + a*(-2*d^2
 + (8*d*e*x^r)/(-2 + r) + (2*e^2*x^(2*r))/(-1 + r)) + 2*b*(-d^2 + (4*d*e*x^
r)/(-2 + r) + (e^2*x^(2*r))/(-1 + r))*Log[c*x^n])/(4*x^2)
```

fricas [B] time = 0.49, size = 457, normalized size = 3.39

$$-\frac{\left(bd^2n+2\,ad^2\right)r^4+4\,bd^2n-6\left(bd^2n+2\,ad^2\right)r^3+8\,ad^2+13\left(bd^2n+2\,ad^2\right)r^2-12\left(bd^2n+2\,ad^2\right)r-\left(2\,ae^2r^3-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] -1/4*((b*d^2*n + 2*a*d^2)*r^4 + 4*b*d^2*n - 6*(b*d^2*n + 2*a*d^2)*r^3 + 8*a
*d^2 + 13*(b*d^2*n + 2*a*d^2)*r^2 - 12*(b*d^2*n + 2*a*d^2)*r - (2*a*e^2*r^3
 - 4*b*e^2*n - 8*a*e^2 - (b*e^2*n + 10*a*e^2)*r^2 + 4*(b*e^2*n + 4*a*e^2)*r
 + 2*(b*e^2*r^3 - 5*b*e^2*r^2 + 8*b*e^2*r - 4*b*e^2)*log(c) + 2*(b*e^2*n*r^
3 - 5*b*e^2*n*r^2 + 8*b*e^2*n*r - 4*b*e^2*n)*log(x))*x^(2*r) - 8*(a*d*e*r^3
 - b*d*e*n - 2*a*d*e - (b*d*e*n + 4*a*d*e)*r^2 + (2*b*d*e*n + 5*a*d*e)*r +
(b*d*e*r^3 - 4*b*d*e*r^2 + 5*b*d*e*r - 2*b*d*e)*log(c) + (b*d*e*n*r^3 - 4*b
*d*e*n*r^2 + 5*b*d*e*n*r - 2*b*d*e*n)*log(x))*x^r + 2*(b*d^2*r^4 - 6*b*d^2*
r^3 + 13*b*d^2*r^2 - 12*b*d^2*r + 4*b*d^2)*log(c) + 2*(b*d^2*n*r^4 - 6*b*d^
2*n*r^3 + 13*b*d^2*n*r^2 - 12*b*d^2*n*r + 4*b*d^2*n)*log(x))/((r^4 - 6*r^3
+ 13*r^2 - 12*r + 4)*x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r+d)^2\left(b\log\left(cx^n\right)+a\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^3, x)
```

maple [C] time = 0.33, size = 1923, normalized size = 14.24

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(b*ln(c*x^n)+a)/x^3,x)
```

```
[Out] -1/2*b*(-e^2*(x^r)^2*r+d^2*r^2-4*d*e*r*x^r+2*(x^r)^2*e^2-3*d^2*r+4*d*e*x^r+
2*d^2)/x^2/(r-1)/(r-2)*ln(x^n)-1/4*(4*I*Pi*b*d*e*r^3*x^r*csgn(I*c)*csgn(I*x
^n)*csgn(I*c*x^n)+8*ln(c)*b*e^2*(x^r)^2-2*a*e^2*r^3*(x^r)^2+16*a*d*e*x^r+10
*a*e^2*r^2*(x^r)^2-16*a*e^2*r*(x^r)^2+4*b*e^2*n*(x^r)^2+2*b*d^2*r^4*ln(c)-1
2*b*d^2*r^3*ln(c)+26*b*d^2*r^2*ln(c)-24*b*d^2*r*ln(c)+8*a*d^2+b*d^2*n*r^4-6
*b*d^2*n*r^3+4*b*d^2*n+8*a*e^2*(x^r)^2+8*b*d^2*ln(c)+2*a*d^2*r^4+13*b*d^2*n
*r^2-12*b*d^2*n*r+26*a*d^2*r^2-24*a*d^2*r-12*a*d^2*r^3+12*I*Pi*b*d^2*r*csgn
(I*c*x^n)^3+5*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-I*Pi*b*d^2
*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*(x^r)^2-5*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*(x^r)^2+16*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-5*I*Pi*b*e^2*r^2*c
sgn(I*c*x^n)^3*(x^r)^2-8*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r
+16*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+6*I*Pi*b*d^2*r^3*csgn(I*
c*x^n)^3-16*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+20*I*Pi*
b*d*e*r*x^r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+b*e^2*n*r^2*(x^r)^2-8*a*d*e
*r^3*x^r+32*a*d*e*r^2*x^r-40*a*d*e*r*x^r-4*b*e^2*n*r*(x^r)^2+8*b*d*e*n*x^r+
10*ln(c)*b*e^2*r^2*(x^r)^2-16*ln(c)*b*e^2*r*(x^r)^2+16*b*d*e*x^r*ln(c)-2*ln
(c)*b*e^2*r^3*(x^r)^2+I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-6*I*Pi*b*d^2*r
^3*csgn(I*c)*csgn(I*c*x^n)^2-16*b*d*e*n*r*x^r+8*b*d*e*n*r^2*x^r+32*b*d*e*r^
2*x^r*ln(c)-40*b*d*e*r*x^r*ln(c)-8*b*d*e*r^3*x^r*ln(c)+13*I*Pi*b*d^2*r^2*cs
gn(I*x^n)*csgn(I*c*x^n)^2+13*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)-8*I*P
i*b*d*e*csgn(I*c*x^n)^3*x^r+4*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^
2+8*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+8*I*Pi*b*d*e*csgn(I*c*x^n)^2
*csgn(I*c)*x^r+5*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-16*I*Pi*b
*d*e*r^2*csgn(I*c*x^n)^3*x^r-13*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)+6*I*Pi*b*d^2*r^3*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-8*I*Pi*b*e^2*r
*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-4*I*Pi*b*d^2*csgn(I*c*x^n)^3-I*Pi*b*e^
2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+12*I*Pi*b*d^2*r*csgn(I*c)*csgn(I*
x^n)*csgn(I*c*x^n)-I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+4*I*Pi*
b*d*e*r^3*x^r*csgn(I*c*x^n)^3+20*I*Pi*b*d*e*r*x^r*csgn(I*c*x^n)^3-8*I*Pi*b*
e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-6*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I
*c*x^n)^2-12*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*b*d^2*r*csgn(
I*c)*csgn(I*c*x^n)^2+I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^
r)^2+I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d^2*r^4*csgn(I*c*x^n
)^2*csgn(I*c)+4*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-4*I*Pi*b*d^2*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-13*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+4*I*Pi
*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+8*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+8
*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-20*I*Pi*b*d*e*r*x
^r*csgn(I*x^n)*csgn(I*c*x^n)^2-20*I*Pi*b*d*e*r*x^r*csgn(I*c)*csgn(I*c*x^n)^
2+4*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3-4*I
*Pi*b*d*e*r^3*x^r*csgn(I*x^n)*csgn(I*c*x^n)^2-4*I*Pi*b*d*e*r^3*x^r*csgn(I*c
)*csgn(I*c*x^n)^2-4*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2)/(r-1)^2/x^2/(r-2)^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
```

```
elp (example of legal syntax is 'assume(r-3>0)', see `assume?` for more det
ails)Is r-3 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^r)^2\,(a+b\,\ln(c\,x^n))}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^3,x)
```

```
[Out] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^3, x)
```

sympy [A] time = 15.65, size = 2807, normalized size = 20.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] Piecewise((-a*d**2/(2*x**2) - 2*a*d*e/x + a*e**2*log(x) + b*d**2*(-n/(4*x**
2) - log(c*x**n)/(2*x**2)) + 2*b*d*e*(-n/x - log(c*x**n)/x) - b*e**2*Piecew
ise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True)), Eq(r, 1)),
(-a*d**2/(2*x**2) + 2*a*d*e*log(x) + a*e**2*x**2/2 - b*d**2*n*log(x)/(2*x**
2) - b*d**2*n/(4*x**2) - b*d**2*log(c)/(2*x**2) + b*d*e*n*log(x)**2 + 2*b*d
*e*log(c)*log(x) + b*e**2*n*x**2*log(x)/2 - b*e**2*n*x**2/4 + b*e**2*x**2*l
og(c)/2, Eq(r, 2)), (-2*a*d**2*r**4/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x
**2 - 48*r*x**2 + 16*x**2) + 12*a*d**2*r**3/(4*r**4*x**2 - 24*r**3*x**2 + 5
2*r**2*x**2 - 48*r*x**2 + 16*x**2) - 26*a*d**2*r**2/(4*r**4*x**2 - 24*r**3*
x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) + 24*a*d**2*r/(4*r**4*x**2 - 24*
r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) - 8*a*d**2/(4*r**4*x**2 - 2
4*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) + 8*a*d*e*r**3*x**r/(4*r*
*4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) - 32*a*d*e*r**
2*x**r/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) +
40*a*d*e*r*x**r/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16
*x**2) - 16*a*d*e*x**r/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x*
*2 + 16*x**2) + 2*a*e**2*r**3*x**(2*r)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**
2*x**2 - 48*r*x**2 + 16*x**2) - 10*a*e**2*r**2*x**(2*r)/(4*r**4*x**2 - 24*r
**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) + 16*a*e**2*r*x**(2*r)/(4*r*
*4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) - 8*a*e**2*x**
(2*r)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) - 2
*b*d**2*n*r**4*log(x)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**
2 + 16*x**2) - b*d**2*n*r**4/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 4
8*r*x**2 + 16*x**2) + 12*b*d**2*n*r**3*log(x)/(4*r**4*x**2 - 24*r**3*x**2 +
 52*r**2*x**2 - 48*r*x**2 + 16*x**2) + 6*b*d**2*n*r**3/(4*r**4*x**2 - 24*r*
*3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) - 26*b*d**2*n*r**2*log(x)/(4*
r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) - 13*b*d**2*
n*r**2/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) +
24*b*d**2*n*r*log(x)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2
 + 16*x**2) + 12*b*d**2*n*r/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48
*r*x**2 + 16*x**2) - 8*b*d**2*n*log(x)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**
2*x**2 - 48*r*x**2 + 16*x**2) - 4*b*d**2*n/(4*r**4*x**2 - 24*r**3*x**2 + 52
*r**2*x**2 - 48*r*x**2 + 16*x**2) - 2*b*d**2*r**4*log(c)/(4*r**4*x**2 - 24*
r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) + 12*b*d**2*r**3*log(c)/(4*
r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) - 26*b*d**2*
r**2*log(c)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**
2) + 24*b*d**2*r*log(c)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x
**2 + 16*x**2) - 8*b*d**2*log(c)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2
 - 48*r*x**2 + 16*x**2) + 8*b*d*e*n*r**3*x**r*log(x)/(4*r**4*x**2 - 24*r**3
```

```
*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) - 32*b*d*e*n*r**2*x**r*log(x)/(
4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) - 8*b*d*e*
n*r**2*x**r/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**
2) + 40*b*d*e*n*r*x**r*log(x)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 -
48*r*x**2 + 16*x**2) + 16*b*d*e*n*r*x**r/(4*r**4*x**2 - 24*r**3*x**2 + 52*r
**2*x**2 - 48*r*x**2 + 16*x**2) - 16*b*d*e*n*x**r*log(x)/(4*r**4*x**2 - 24*
r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) - 8*b*d*e*n*x**r/(4*r**4*x*
*2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) + 8*b*d*e*r**3*x**r
*log(c)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) -
 32*b*d*e*r**2*x**r*log(c)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*
r*x**2 + 16*x**2) + 40*b*d*e*r*x**r*log(c)/(4*r**4*x**2 - 24*r**3*x**2 + 52
*r**2*x**2 - 48*r*x**2 + 16*x**2) - 16*b*d*e*x**r*log(c)/(4*r**4*x**2 - 24*
r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) + 2*b*e**2*n*r**3*x**(2*r)*
log(x)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) -
10*b*e**2*n*r**2*x**(2*r)*log(x)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2
 - 48*r*x**2 + 16*x**2) - b*e**2*n*r**2*x**(2*r)/(4*r**4*x**2 - 24*r**3*x**
2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) + 16*b*e**2*n*r*x**(2*r)*log(x)/(4*
r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) + 4*b*e**2*n
*r*x**(2*r)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**
2) - 8*b*e**2*n*x**(2*r)*log(x)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2
- 48*r*x**2 + 16*x**2) - 4*b*e**2*n*x**(2*r)/(4*r**4*x**2 - 24*r**3*x**2 +
52*r**2*x**2 - 48*r*x**2 + 16*x**2) + 2*b*e**2*r**3*x**(2*r)*log(c)/(4*r**4
*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2) - 10*b*e**2*r**2
*x**(2*r)*log(c)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 1
6*x**2) + 16*b*e**2*r*x**(2*r)*log(c)/(4*r**4*x**2 - 24*r**3*x**2 + 52*r**2
*x**2 - 48*r*x**2 + 16*x**2) - 8*b*e**2*x**(2*r)*log(c)/(4*r**4*x**2 - 24*r
**3*x**2 + 52*r**2*x**2 - 48*r*x**2 + 16*x**2), True))
```

3.384 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=135

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{2dex^{r-4}\left(a+b\log\left(cx^n\right)\right)}{4-r}-\frac{e^2x^{-2(2-r)}\left(a+b\log\left(cx^n\right)\right)}{2(2-r)}-\frac{bd^2n}{16x^4}-\frac{2bdenx^{r-4}}{(4-r)^2}-\frac{be^2nx^{-2(2-r)}}{4(2-r)^2}$$

```
[Out] -1/16*b*d^2*n/x^4-1/4*b*e^2*n/(2-r)^2/(x^(4-2*r))-2*b*d*e*n*x^(-4+r)/(4-r)^
2-1/4*d^2*(a+b*ln(c*x^n))/x^4-1/2*e^2*(a+b*ln(c*x^n))/(2-r)/(x^(4-2*r))-2*d
*e*x^(-4+r)*(a+b*ln(c*x^n))/(4-r)
```

Rubi [A] time = 0.16, antiderivative size = 115, normalized size of antiderivative = 0.85, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{8dex^{r-4}}{4-r}+\frac{2e^2x^{-2(2-r)}}{2-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{16x^4}-\frac{2bdenx^{r-4}}{(4-r)^2}-\frac{be^2nx^{-2(2-r)}}{4(2-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d^2*n)/(16*x^4) - (b*e^2*n)/(4*(2 - r)^2*x^(2*(2 - r))) - (2*b*d*e*n*x^
(-4 + r))/(4 - r)^2 - ((d^2/x^4 + (2*e^2)/((2 - r)*x^(2*(2 - r))) + (8*d*e*
x^(-4 + r))/(4 - r))*(a + b*Log[c*x^n]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^2\left(a+b\log\left(cx^n\right)\right)}{x^5}\,dx = -\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{2e^2x^{-2(2-r)}}{2-r}+\frac{8dex^{-4+r}}{4-r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{-d^2\left(8-6r\right.}{}$$
$$= -\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{2e^2x^{-2(2-r)}}{2-r}+\frac{8dex^{-4+r}}{4-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int\frac{-d^2\left(8-6r+r^2\right)+8}{}}{4\left(8-\right.}$$
$$= -\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{2e^2x^{-2(2-r)}}{2-r}+\frac{8dex^{-4+r}}{4-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int\left(-\frac{d^2(-4+r)(-2-}{x^5}\right.}{}$$
$$= -\frac{bd^2n}{16x^4}-\frac{be^2nx^{-2(2-r)}}{4(2-r)^2}-\frac{2bdenx^{-4+r}}{(4-r)^2}-\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{2e^2x^{-2(2-r)}}{2-r}+\frac{8dex^{-4+r}}{4-r}\right)(a$$

Mathematica [A] time = 0.32, size = 121, normalized size = 0.90

$$\frac{a\left(-4d^2+\frac{32dex^r}{r-4}+\frac{8e^2x^{2r}}{r-2}\right)+4b\log\left(cx^n\right)\left(-d^2+\frac{8dex^r}{r-4}+\frac{2e^2x^{2r}}{r-2}\right)+bn\left(-d^2-\frac{32dex^r}{(r-4)^2}-\frac{4e^2x^{2r}}{(r-2)^2}\right)}{16x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] (b*n*(-d^2 - (32*d*e*x^r)/(-4 + r)^2 - (4*e^2*x^(2*r))/(-2 + r)^2) + a*(-4*
d^2 + (32*d*e*x^r)/(-4 + r) + (8*e^2*x^(2*r))/(-2 + r)) + 4*b*(-d^2 + (8*d*
e*x^r)/(-4 + r) + (2*e^2*x^(2*r))/(-2 + r))*Log[c*x^n])/(16*x^4)
```

fricas [B] time = 0.49, size = 457, normalized size = 3.39

$$-\frac{\left(bd^2n+4\,ad^2\right)r^4+64\,bd^2n-12\left(bd^2n+4\,ad^2\right)r^3+256\,ad^2+52\left(bd^2n+4\,ad^2\right)r^2-96\left(bd^2n+4\,ad^2\right)r-4\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] -1/16*((b*d^2*n + 4*a*d^2)*r^4 + 64*b*d^2*n - 12*(b*d^2*n + 4*a*d^2)*r^3 +
256*a*d^2 + 52*(b*d^2*n + 4*a*d^2)*r^2 - 96*(b*d^2*n + 4*a*d^2)*r - 4*(2*a*
e^2*r^3 - 16*b*e^2*n - 64*a*e^2 - (b*e^2*n + 20*a*e^2)*r^2 + 8*(b*e^2*n + 8
*a*e^2)*r + 2*(b*e^2*r^3 - 10*b*e^2*r^2 + 32*b*e^2*r - 32*b*e^2)*log(c) + 2
*(b*e^2*n*r^3 - 10*b*e^2*n*r^2 + 32*b*e^2*n*r - 32*b*e^2*n)*log(x))*x^(2*r)
 - 32*(a*d*e*r^3 - 4*b*d*e*n - 16*a*d*e - (b*d*e*n + 8*a*d*e)*r^2 + 4*(b*d*
e*n + 5*a*d*e)*r + (b*d*e*r^3 - 8*b*d*e*r^2 + 20*b*d*e*r - 16*b*d*e)*log(c)
 + (b*d*e*n*r^3 - 8*b*d*e*n*r^2 + 20*b*d*e*n*r - 16*b*d*e*n)*log(x))*x^r +
4*(b*d^2*r^4 - 12*b*d^2*r^3 + 52*b*d^2*r^2 - 96*b*d^2*r + 64*b*d^2)*log(c)
+ 4*(b*d^2*n*r^4 - 12*b*d^2*n*r^3 + 52*b*d^2*n*r^2 - 96*b*d^2*n*r + 64*b*d^
2*n)*log(x))/((r^4 - 12*r^3 + 52*r^2 - 96*r + 64)*x^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r+d)^2\left(b\log\left(cx^n\right)+a\right)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^5, x)
```

maple [C] time = 0.32, size = 1924, normalized size = 14.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(b*ln(c*x^n)+a)/x^5,x)
```

```
[Out] -1/4*b*(-2*e^2*(x^r)^2*r+d^2*r^2-8*d*e*r*x^r+8*(x^r)^2*e^2-6*d^2*r+16*d*e*x
^r+8*d^2)/x^4/(r-2)/(r-4)*ln(x^n)-1/16*(256*ln(c)*b*e^2*(x^r)^2-8*a*e^2*r^3
*(x^r)^2+512*a*d*e*x^r+80*a*e^2*r^2*(x^r)^2-256*a*e^2*r*(x^r)^2+64*b*e^2*n*
(x^r)^2+4*b*d^2*r^4*ln(c)-48*b*d^2*r^3*ln(c)+208*b*d^2*r^2*ln(c)-384*b*d^2*
r*ln(c)+256*a*d^2+b*d^2*n*r^4-12*b*d^2*n*r^3+64*b*d^2*n+256*a*e^2*(x^r)^2+1
28*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+2*I*Pi*b*d^2*r^4*csgn(I*c
*x^n)^2*csgn(I*c)-256*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r-40*I*Pi*b*e^2*r^2*csgn
(I*c*x^n)^3*(x^r)^2+128*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+256*
b*d^2*ln(c)+4*a*d^2*r^4+52*b*d^2*n*r^2-96*b*d^2*n*r+208*a*d^2*r^2-384*a*d^2
*r-48*a*d^2*r^3-40*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)
^2+128*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-256*I*Pi*b*d*e*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+40*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)
^2*(x^r)^2+320*I*Pi*b*d*e*r*x^r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+192*I*P
i*b*d^2*r*csgn(I*c*x^n)^3-104*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+128*I*Pi*b*d^2
*csgn(I*x^n)*csgn(I*c*x^n)^2+128*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+16*I*
Pi*b*d*e*r^3*x^r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+4*b*e^2*n*r^2*(x^r)^2-
32*a*d*e*r^3*x^r+256*a*d*e*r^2*x^r-640*a*d*e*r*x^r-32*b*e^2*n*r*(x^r)^2+128
*b*d*e*n*x^r+80*ln(c)*b*e^2*r^2*(x^r)^2-256*ln(c)*b*e^2*r*(x^r)^2+512*b*d*e
*x^r*ln(c)-8*ln(c)*b*e^2*r^3*(x^r)^2-192*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*
x^n)^2-128*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-128*b*d*e
*n*r*x^r+32*b*d*e*n*r^2*x^r+256*b*d*e*r^2*x^r*ln(c)-640*b*d*e*r*x^r*ln(c)-3
2*b*d*e*r^3*x^r*ln(c)+104*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b
*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-192*I*Pi*b*d^2*r*csgn(I*c)*csgn(I*c*x^
n)^2+128*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+40*I*Pi*b*e^2*r^2*csg
n(I*c*x^n)^2*csgn(I*c)*(x^r)^2-128*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^3*x^r-104*I
*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b*d^2*r^4*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-128*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*(x^r)^2+256*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+256*I*Pi*b*d*e*c
sgn(I*c*x^n)^2*csgn(I*c)*x^r+4*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-4*I*P
i*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-128*I*Pi*b*e^2*r*csgn(I*x^n)*
csgn(I*c*x^n)^2*(x^r)^2-4*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^
2+192*I*Pi*b*d^2*r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-128*I*Pi*b*d^2*csgn(
I*c*x^n)^3+16*I*Pi*b*d*e*r^3*x^r*csgn(I*c*x^n)^3+320*I*Pi*b*d*e*r*x^r*csgn(
I*c*x^n)^3-128*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+24*I*Pi*b*d^2
*r^3*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-2*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3-1
28*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2-24*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*
c*x^n)^2-24*I*Pi*b*d^2*r^3*csgn(I*c)*csgn(I*c*x^n)^2-128*I*Pi*b*d^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+104*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2
+24*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^3+128*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2
-16*I*Pi*b*d*e*r^3*x^r*csgn(I*x^n)*csgn(I*c*x^n)^2-16*I*Pi*b*d*e*r^3*x^r*cs
gn(I*c)*csgn(I*c*x^n)^2+4*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*(x^r)^2+128*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-320*
I*Pi*b*d*e*r*x^r*csgn(I*x^n)*csgn(I*c*x^n)^2-320*I*Pi*b*d*e*r*x^r*csgn(I*c)
*csgn(I*c*x^n)^2)/(r-2)^2/x^4/(r-4)^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-5>0)', see `assume?` for more det
ails)Is r-5 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^r)^2\,(a+b\,\ln(c\,x^n))}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^5,x)
```

```
[Out] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^5, x)
```

sympy [A] time = 49.70, size = 2815, normalized size = 20.85

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] Piecewise((-a*d**2/(4*x**4) - a*d*e/x**2 + a*e**2*log(x) + b*d**2*(-n/(16*x
**4) - log(c*x**n)/(4*x**4)) + 2*b*d*e*(-n/(4*x**2) - log(c*x**n)/(2*x**2))
 - b*e**2*Piecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), Tru
e)), Eq(r, 2)), (-a*d**2/(4*x**4) + 2*a*d*e*log(x) + a*e**2*x**4/4 - b*d**2
*n*log(x)/(4*x**4) - b*d**2*n/(16*x**4) - b*d**2*log(c)/(4*x**4) + b*d*e*n*
log(x)**2 + 2*b*d*e*log(c)*log(x) + b*e**2*n*x**4*log(x)/4 - b*e**2*n*x**4/
16 + b*e**2*x**4*log(c)/4, Eq(r, 4)), (-4*a*d**2*r**4/(16*r**4*x**4 - 192*r
**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) + 48*a*d**2*r**3/(16*r*
*4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 208*a*
d**2*r**2/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 102
4*x**4) + 384*a*d**2*r/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536
*r*x**4 + 1024*x**4) - 256*a*d**2/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*
x**4 - 1536*r*x**4 + 1024*x**4) + 32*a*d*e*r**3*x**r/(16*r**4*x**4 - 192*r*
*3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 256*a*d*e*r**2*x**r/(1
6*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) + 64
0*a*d*e*r*x**r/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4
+ 1024*x**4) - 512*a*d*e*x**r/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4
 - 1536*r*x**4 + 1024*x**4) + 8*a*e**2*r**3*x**(2*r)/(16*r**4*x**4 - 192*r*
*3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 80*a*e**2*r**2*x**(2*r
)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4)
+ 256*a*e**2*r*x**(2*r)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 153
6*r*x**4 + 1024*x**4) - 256*a*e**2*x**(2*r)/(16*r**4*x**4 - 192*r**3*x**4 +
 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 4*b*d**2*n*r**4*log(x)/(16*r**4
*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - b*d**2*n
*r**4/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x*
*4) + 48*b*d**2*n*r**3*log(x)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4
 - 1536*r*x**4 + 1024*x**4) + 12*b*d**2*n*r**3/(16*r**4*x**4 - 192*r**3*x**
4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 208*b*d**2*n*r**2*log(x)/(16
*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 52*
b*d**2*n*r**2/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 +
 1024*x**4) + 384*b*d**2*n*r*log(x)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**
2*x**4 - 1536*r*x**4 + 1024*x**4) + 96*b*d**2*n*r/(16*r**4*x**4 - 192*r**3*
x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 256*b*d**2*n*log(x)/(16*r
**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 64*b*
d**2*n/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x
**4) - 4*b*d**2*r**4*log(c)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 -
 1536*r*x**4 + 1024*x**4) + 48*b*d**2*r**3*log(c)/(16*r**4*x**4 - 192*r**3*
```

```
x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 208*b*d**2*r**2*log(c)/(1
6*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) + 38
4*b*d**2*r*log(c)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x*
*4 + 1024*x**4) - 256*b*d**2*log(c)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**
2*x**4 - 1536*r*x**4 + 1024*x**4) + 32*b*d*e*n*r**3*x**r*log(x)/(16*r**4*x*
*4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 256*b*d*e*n
*r**2*x**r*log(x)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x*
*4 + 1024*x**4) - 32*b*d*e*n*r**2*x**r/(16*r**4*x**4 - 192*r**3*x**4 + 832*
r**2*x**4 - 1536*r*x**4 + 1024*x**4) + 640*b*d*e*n*r*x**r*log(x)/(16*r**4*x
**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) + 128*b*d*e*
n*r*x**r/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024
*x**4) - 512*b*d*e*n*x**r*log(x)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x
**4 - 1536*r*x**4 + 1024*x**4) - 128*b*d*e*n*x**r/(16*r**4*x**4 - 192*r**3*
x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) + 32*b*d*e*r**3*x**r*log(c)
/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) -
 256*b*d*e*r**2*x**r*log(c)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 -
 1536*r*x**4 + 1024*x**4) + 640*b*d*e*r*x**r*log(c)/(16*r**4*x**4 - 192*r**
3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 512*b*d*e*x**r*log(c)/(
16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) + 8
*b*e**2*n*r**3*x**(2*r)*log(x)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**
4 - 1536*r*x**4 + 1024*x**4) - 80*b*e**2*n*r**2*x**(2*r)*log(x)/(16*r**4*x*
*4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 4*b*e**2*n*
r**2*x**(2*r)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 +
 1024*x**4) + 256*b*e**2*n*r*x**(2*r)*log(x)/(16*r**4*x**4 - 192*r**3*x**4
+ 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) + 32*b*e**2*n*r*x**(2*r)/(16*r**
4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 256*b*e
**2*n*x**(2*r)*log(x)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*
r*x**4 + 1024*x**4) - 64*b*e**2*n*x**(2*r)/(16*r**4*x**4 - 192*r**3*x**4 +
832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) + 8*b*e**2*r**3*x**(2*r)*log(c)/(1
6*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 80
*b*e**2*r**2*x**(2*r)*log(c)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4
- 1536*r*x**4 + 1024*x**4) + 256*b*e**2*r*x**(2*r)*log(c)/(16*r**4*x**4 - 1
92*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 1024*x**4) - 256*b*e**2*x**(2*
r)*log(c)/(16*r**4*x**4 - 192*r**3*x**4 + 832*r**2*x**4 - 1536*r*x**4 + 102
4*x**4), True))
```

3.385 $\int x^4 (d+ex^r)^2 \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=105

$$\frac{1}{5}\left(d^2x^5+\frac{10dex^{r+5}}{r+5}+\frac{5e^2x^{2r+5}}{2r+5}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bd^2nx^5-\frac{2bdenx^{r+5}}{(r+5)^2}-\frac{be^2nx^{2r+5}}{(2r+5)^2}$$

```
[Out] -1/25*b*d^2*n*x^5-2*b*d*e*n*x^(5+r)/(5+r)^2-b*e^2*n*x^(5+2*r)/(5+2*r)^2+1/5
*(d^2*x^5+10*d*e*x^(5+r)/(5+r)+5*e^2*x^(5+2*r)/(5+2*r))*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.16, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{5}\left(d^2x^5+\frac{10dex^{r+5}}{r+5}+\frac{5e^2x^{2r+5}}{2r+5}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bd^2nx^5-\frac{2bdenx^{r+5}}{(r+5)^2}-\frac{be^2nx^{2r+5}}{(2r+5)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^5)/25 - (2*b*d*e*n*x^(5 + r))/(5 + r)^2 - (b*e^2*n*x^(5 + 2*r))
/(5 + 2*r)^2 + ((d^2*x^5 + (10*d*e*x^(5 + r))/(5 + r) + (5*e^2*x^(5 + 2*r))
/(5 + 2*r))*(a + b*Log[c*x^n]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^4 (d+ex^r)^2 \left(a+b\log\left(cx^n\right)\right) dx = \frac{1}{5}\left(d^2x^5+\frac{10dex^{5+r}}{5+r}+\frac{5e^2x^{5+2r}}{5+2r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{1}{5}x^4\left(d^2+\frac{10d}{5+}\right.$$
$$=\frac{1}{5}\left(d^2x^5+\frac{10dex^{5+r}}{5+r}+\frac{5e^2x^{5+2r}}{5+2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{5}(bn)\int x^4\left(d^2+\frac{10d}{5+}\right.$$
$$=\frac{1}{5}\left(d^2x^5+\frac{10dex^{5+r}}{5+r}+\frac{5e^2x^{5+2r}}{5+2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{5}(bn)\int \left(d^2x^4+\frac{5e^2x}{5+}\right.$$
$$=-\frac{1}{25}bd^2nx^5-\frac{2bdenx^{5+r}}{(5+r)^2}-\frac{be^2nx^{5+2r}}{(5+2r)^2}+\frac{1}{5}\left(d^2x^5+\frac{10dex^{5+r}}{5+r}+\frac{5e^2x^{5+2r}}{5+2r}\right)($$

Mathematica [A] time = 0.26, size = 124, normalized size = 1.18

$$\frac{1}{25}x^5\left(5a\left(d^2+\frac{10dex^r}{r+5}+\frac{5e^2x^{2r}}{2r+5}\right)+5b\log\left(cx^n\right)\left(d^2+\frac{10dex^r}{r+5}+\frac{5e^2x^{2r}}{2r+5}\right)+bn\left(-d^2-\frac{50dex^r}{(r+5)^2}-\frac{25e^2x^{2r}}{(2r+5)^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^5*(b*n*(-d^2 - (50*d*e*x^r)/(5 + r)^2 - (25*e^2*x^(2*r))/(5 + 2*r)^2) +
5*a*(d^2 + (10*d*e*x^r)/(5 + r) + (5*e^2*x^(2*r))/(5 + 2*r)) + 5*b*(d^2 + (
10*d*e*x^r)/(5 + r) + (5*e^2*x^(2*r))/(5 + 2*r))*Log[c*x^n]))/25
```

fricas [B] time = 0.43, size = 497, normalized size = 4.73

$$5\left(4\,bd^2r^4+60\,bd^2r^3+325\,bd^2r^2+750\,bd^2r+625\,bd^2\right)x^5\log(c)+5\left(4\,bd^2nr^4+60\,bd^2nr^3+325\,bd^2nr^2+750\,b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/25*(5*(4*b*d^2*r^4 + 60*b*d^2*r^3 + 325*b*d^2*r^2 + 750*b*d^2*r + 625*b*d
^2)*x^5*log(c) + 5*(4*b*d^2*n*r^4 + 60*b*d^2*n*r^3 + 325*b*d^2*n*r^2 + 750*
b*d^2*n*r + 625*b*d^2*n)*x^5*log(x) - (4*(b*d^2*n - 5*a*d^2)*r^4 + 625*b*d^
2*n + 60*(b*d^2*n - 5*a*d^2)*r^3 - 3125*a*d^2 + 325*(b*d^2*n - 5*a*d^2)*r^2
 + 750*(b*d^2*n - 5*a*d^2)*r)*x^5 + 25*((2*b*e^2*r^3 + 25*b*e^2*r^2 + 100*b
*e^2*r + 125*b*e^2)*x^5*log(c) + (2*b*e^2*n*r^3 + 25*b*e^2*n*r^2 + 100*b*e^
2*n*r + 125*b*e^2*n)*x^5*log(x) + (2*a*e^2*r^3 - 25*b*e^2*n + 125*a*e^2 - (
b*e^2*n - 25*a*e^2)*r^2 - 10*(b*e^2*n - 10*a*e^2)*r)*x^5)*x^(2*r) + 50*((4*
b*d*e*r^3 + 40*b*d*e*r^2 + 125*b*d*e*r + 125*b*d*e)*x^5*log(c) + (4*b*d*e*n
*r^3 + 40*b*d*e*n*r^2 + 125*b*d*e*n*r + 125*b*d*e*n)*x^5*log(x) + (4*a*d*e*
r^3 - 25*b*d*e*n + 125*a*d*e - 4*(b*d*e*n - 10*a*d*e)*r^2 - 5*(4*b*d*e*n -
25*a*d*e)*r)*x^5)*x^r)/(4*r^4 + 60*r^3 + 325*r^2 + 750*r + 625)
```

giac [B] time = 0.40, size = 746, normalized size = 7.10

$$20\,bd^2nr^4x^5\log(x)+200\,bdnr^3x^5x^re\log(x)-4\,bd^2nr^4x^5+20\,bd^2r^4x^5\log(c)+200\,bdr^3x^5x^re\log(c)+300\,bd^2nr$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/25*(20*b*d^2*n*r^4*x^5*log(x) + 200*b*d*n*r^3*x^5*x^r*e*log(x) - 4*b*d^2*
n*r^4*x^5 + 20*b*d^2*r^4*x^5*log(c) + 200*b*d*r^3*x^5*x^r*e*log(c) + 300*b*
d^2*n*r^3*x^5*log(x) + 50*b*n*r^3*x^5*x^(2*r)*e^2*log(x) + 2000*b*d*n*r^2*x
```

```
^5*x^r*e*log(x) - 60*b*d^2*n*r^3*x^5 + 20*a*d^2*r^4*x^5 - 200*b*d*n*r^2*x^5
*x^r*e + 200*a*d*r^3*x^5*x^r*e + 300*b*d^2*r^3*x^5*log(c) + 50*b*r^3*x^5*x^
(2*r)*e^2*log(c) + 2000*b*d*r^2*x^5*x^r*e*log(c) + 1625*b*d^2*n*r^2*x^5*log
(x) + 625*b*n*r^2*x^5*x^(2*r)*e^2*log(x) + 6250*b*d*n*r*x^5*x^r*e*log(x) -
325*b*d^2*n*r^2*x^5 + 300*a*d^2*r^3*x^5 - 25*b*n*r^2*x^5*x^(2*r)*e^2 + 50*a
*r^3*x^5*x^(2*r)*e^2 - 1000*b*d*n*r*x^5*x^r*e + 2000*a*d*r^2*x^5*x^r*e + 16
25*b*d^2*r^2*x^5*log(c) + 625*b*r^2*x^5*x^(2*r)*e^2*log(c) + 6250*b*d*r*x^5
*x^r*e*log(c) + 3750*b*d^2*n*r*x^5*log(x) + 2500*b*n*r*x^5*x^(2*r)*e^2*log(
x) + 6250*b*d*n*x^5*x^r*e*log(x) - 750*b*d^2*n*r*x^5 + 1625*a*d^2*r^2*x^5 -
 250*b*n*r*x^5*x^(2*r)*e^2 + 625*a*r^2*x^5*x^(2*r)*e^2 - 1250*b*d*n*x^5*x^r
*e + 6250*a*d*r*x^5*x^r*e + 3750*b*d^2*r*x^5*log(c) + 2500*b*r*x^5*x^(2*r)*
e^2*log(c) + 6250*b*d*x^5*x^r*e*log(c) + 3125*b*d^2*n*x^5*log(x) + 3125*b*n
*x^5*x^(2*r)*e^2*log(x) - 625*b*d^2*n*x^5 + 3750*a*d^2*r*x^5 - 625*b*n*x^5*
x^(2*r)*e^2 + 2500*a*r*x^5*x^(2*r)*e^2 + 6250*a*d*x^5*x^r*e + 3125*b*d^2*x^
5*log(c) + 3125*b*x^5*x^(2*r)*e^2*log(c) + 3125*a*d^2*x^5 + 3125*a*x^5*x^(2
*r)*e^2)/(4*r^4 + 60*r^3 + 325*r^2 + 750*r + 625)
```

maple [C] time = 0.37, size = 1930, normalized size = 18.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d+e*x^r)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/5*x^5*b*(5*e^2*(x^r)^2*r+2*d^2*r^2+20*d*e*r*x^r+25*(x^r)^2*e^2+15*d^2*r+5
0*d*e*x^r+25*d^2)/(5+2*r)/(r+5)*ln(x^n)-1/50*x^5*(6250*I*Pi*b*d*e*r*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-6250*ln(c)*b*e^2*(x^r)^2-100*a*e^2*r^3*(x^
r)^2-12500*a*d*e*x^r-1250*a*e^2*r^2*(x^r)^2-5000*a*e^2*r*(x^r)^2+1250*b*e^2
*n*(x^r)^2-40*b*d^2*r^4*ln(c)-600*b*d^2*r^3*ln(c)-3250*b*d^2*r^2*ln(c)-7500
*b*d^2*r*ln(c)-6250*a*d^2+8*b*d^2*n*r^4+120*b*d^2*n*r^3+1250*b*d^2*n-6250*a
*e^2*(x^r)^2-6250*b*d^2*ln(c)-40*a*d^2*r^4+650*b*d^2*n*r^2+1500*b*d^2*n*r-3
250*a*d^2*r^2-7500*a*d^2*r-600*a*d^2*r^3-200*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2
*csgn(I*c)*x^r+50*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^
2-3125*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+20*I*Pi*b*d^2*r^4*csgn(I*c*x^n)
^3+3125*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+3750*I*Pi*b*d^2*r*csgn(I*c*x^n)^
3+50*b*e^2*n*r^2*(x^r)^2-400*a*d*e*r^3*x^r+20*I*Pi*b*d^2*r^4*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-50*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+6
250*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r-4000*a*d*e*r^2*x^r-12500*a*d*e*r*x^r+5
00*b*e^2*n*r*(x^r)^2+2500*b*d*e*n*x^r-1250*ln(c)*b*e^2*r^2*(x^r)^2-5000*ln(
c)*b*e^2*r*(x^r)^2-12500*b*d*e*x^r*ln(c)+3125*I*Pi*b*d^2*csgn(I*c*x^n)^3-10
0*ln(c)*b*e^2*r^3*(x^r)^2+2000*b*d*e*n*r*x^r+400*b*d*e*n*r^2*x^r-4000*b*d*e
*r^2*x^r*ln(c)-12500*b*d*e*r*x^r*ln(c)-400*b*d*e*r^3*x^r*ln(c)+200*I*Pi*b*d
*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2000*I*Pi*b*d*e*r^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-3125*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(
x^r)^2+3125*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-50*I*Pi*b*e^2*r^
3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+200*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^
r+6250*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+625*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x
^r)^2+2500*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+3750*I*Pi*b*d^2*r*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+1625*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)-625*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-6250*I*Pi*b*
d*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-2500*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*
c*x^n)^2*(x^r)^2-6250*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r-2000*I*Pi*
b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-3125*I*Pi*b*e^2*csgn(I*x^n)*csgn(
I*c*x^n)^2*(x^r)^2-300*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2+50*I*Pi*b
*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-625*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*
c)*(x^r)^2+2000*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^3*x^r-6250*I*Pi*b*d*e*csgn(I*c
*x^n)^2*csgn(I*c)*x^r+300*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+3125*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-2500*I*Pi*b*e
^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-6250*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c
*x^n)^2*x^r-200*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-20*I*Pi*b*d^
```

```
2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-20*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn(I*
c)-300*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)+625*I*Pi*b*e^2*r^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-2000*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*csg
n(I*c)*x^r+6250*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2500*I*P
i*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+300*I*Pi*b*d^2*r^3*cs
gn(I*c*x^n)^3-1625*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-3750*I*Pi*b*d
^2*r*csgn(I*c*x^n)^2*csgn(I*c)-3750*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^
2+1625*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3-3125*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*
x^n)^2-1625*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c))/(5+2*r)^2/(r+5)^2
```

maxima [A] time = 1.06, size = 152, normalized size = 1.45

$$-\frac{1}{25}\,bd^2nx^5+\frac{1}{5}\,bd^2x^5\log\left(cx^n\right)+\frac{1}{5}\,ad^2x^5+\frac{be^2x^{2\,r+5}\log\left(cx^n\right)}{2\,r+5}+\frac{2\,bdex^{r+5}\log\left(cx^n\right)}{r+5}-\frac{be^2nx^{2\,r+5}}{(2\,r+5)^2}+\frac{ae^2x^{2\,r+5}}{2\,r+5}-\frac{2\,bdenx}{(r+5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/25*b*d^2*n*x^5 + 1/5*b*d^2*x^5*log(c*x^n) + 1/5*a*d^2*x^5 + b*e^2*x^(2*r
 + 5)*log(c*x^n)/(2*r + 5) + 2*b*d*e*x^(r + 5)*log(c*x^n)/(r + 5) - b*e^2*n
*x^(2*r + 5)/(2*r + 5)^2 + a*e^2*x^(2*r + 5)/(2*r + 5) - 2*b*d*e*n*x^(r + 5
)/(r + 5)^2 + 2*a*d*e*x^(r + 5)/(r + 5)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^4\,\left(d+e\,x^r\right)^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d + e*x^r)^2*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^4*(d + e*x^r)^2*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.386 $\int x^2 (d + ex^r)^2 (a + b \log (cx^n)) \, dx$

Optimal. Leaf size=105

$$\frac{1}{3}\left(d^2x^3 + \frac{6dex^{r+3}}{r+3} + \frac{3e^2x^{2r+3}}{2r+3}\right)(a + b\log(cx^n)) - \frac{1}{9}bd^2nx^3 - \frac{2bdenx^{r+3}}{(r+3)^2} - \frac{be^2nx^{2r+3}}{(2r+3)^2}$$

```
[Out] -1/9*b*d^2*n*x^3-2*b*d*e*n*x^(3+r)/(3+r)^2-b*e^2*n*x^(3+2*r)/(3+2*r)^2+1/3*
(d^2*x^3+6*d*e*x^(3+r)/(3+r)+3*e^2*x^(3+2*r)/(3+2*r))*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.16, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {270, 2334, 12, 14}

$$\frac{1}{3}\left(d^2x^3 + \frac{6dex^{r+3}}{r+3} + \frac{3e^2x^{2r+3}}{2r+3}\right)(a + b\log(cx^n)) - \frac{1}{9}bd^2nx^3 - \frac{2bdenx^{r+3}}{(r+3)^2} - \frac{be^2nx^{2r+3}}{(2r+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^3)/9 - (2*b*d*e*n*x^(3 + r))/(3 + r)^2 - (b*e^2*n*x^(3 + 2*r))/
(3 + 2*r)^2 + ((d^2*x^3 + (6*d*e*x^(3 + r))/(3 + r) + (3*e^2*x^(3 + 2*r))/(
3 + 2*r))*(a + b*Log[c*x^n]))/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] && !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^2 (d+ex^r)^2 \left(a+b\log\left(cx^n\right)\right) dx = \frac{1}{3}\left(d^2x^3+\frac{6dex^{3+r}}{3+r}+\frac{3e^2x^{3+2r}}{3+2r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{1}{3}x^2\left(d^2+\frac{6dex^r}{3+r}\right.$$
$$=\frac{1}{3}\left(d^2x^3+\frac{6dex^{3+r}}{3+r}+\frac{3e^2x^{3+2r}}{3+2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}(bn)\int x^2\left(d^2+\frac{6dex^r}{3+r}\right.$$
$$=\frac{1}{3}\left(d^2x^3+\frac{6dex^{3+r}}{3+r}+\frac{3e^2x^{3+2r}}{3+2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}(bn)\int \left(d^2x^2+\frac{3e^2x^2}{3+}\right.$$
$$=-\frac{1}{9}bd^2nx^3-\frac{2bdenx^{3+r}}{(3+r)^2}-\frac{be^2nx^{3+2r}}{(3+2r)^2}+\frac{1}{3}\left(d^2x^3+\frac{6dex^{3+r}}{3+r}+\frac{3e^2x^{3+2r}}{3+2r}\right)\left(a\right.$$

Mathematica [A] time = 0.27, size = 124, normalized size = 1.18

$$\frac{1}{9}x^3\left(3a\left(d^2+\frac{6dex^r}{r+3}+\frac{3e^2x^{2r}}{2r+3}\right)+3b\log\left(cx^n\right)\left(d^2+\frac{6dex^r}{r+3}+\frac{3e^2x^{2r}}{2r+3}\right)+bn\left(-d^2-\frac{18dex^r}{(r+3)^2}-\frac{9e^2x^{2r}}{(2r+3)^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^3*(b*n*(-d^2 - (18*d*e*x^r)/(3 + r)^2 - (9*e^2*x^(2*r))/(3 + 2*r)^2) + 3
*a*(d^2 + (6*d*e*x^r)/(3 + r) + (3*e^2*x^(2*r))/(3 + 2*r)) + 3*b*(d^2 + (6*
d*e*x^r)/(3 + r) + (3*e^2*x^(2*r))/(3 + 2*r))*Log[c*x^n]))/9
```

fricas [B] time = 0.47, size = 497, normalized size = 4.73

$$\frac{3\left(4\,bd^2r^4+36\,bd^2r^3+117\,bd^2r^2+162\,bd^2r+81\,bd^2\right)x^3\log(c)+3\left(4\,bd^2nr^4+36\,bd^2nr^3+117\,bd^2nr^2+162\,bd^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/9*(3*(4*b*d^2*r^4 + 36*b*d^2*r^3 + 117*b*d^2*r^2 + 162*b*d^2*r + 81*b*d^2
)*x^3*log(c) + 3*(4*b*d^2*n*r^4 + 36*b*d^2*n*r^3 + 117*b*d^2*n*r^2 + 162*b*
d^2*n*r + 81*b*d^2*n)*x^3*log(x) - (4*(b*d^2*n - 3*a*d^2)*r^4 + 81*b*d^2*n
+ 36*(b*d^2*n - 3*a*d^2)*r^3 - 243*a*d^2 + 117*(b*d^2*n - 3*a*d^2)*r^2 + 16
2*(b*d^2*n - 3*a*d^2)*r)*x^3 + 9*((2*b*e^2*r^3 + 15*b*e^2*r^2 + 36*b*e^2*r
+ 27*b*e^2)*x^3*log(c) + (2*b*e^2*n*r^3 + 15*b*e^2*n*r^2 + 36*b*e^2*n*r + 2
7*b*e^2*n)*x^3*log(x) + (2*a*e^2*r^3 - 9*b*e^2*n + 27*a*e^2 - (b*e^2*n - 15
*a*e^2)*r^2 - 6*(b*e^2*n - 6*a*e^2)*r)*x^3)*x^(2*r) + 18*((4*b*d*e*r^3 + 24
*b*d*e*r^2 + 45*b*d*e*r + 27*b*d*e)*x^3*log(c) + (4*b*d*e*n*r^3 + 24*b*d*e*
n*r^2 + 45*b*d*e*n*r + 27*b*d*e*n)*x^3*log(x) + (4*a*d*e*r^3 - 9*b*d*e*n +
27*a*d*e - 4*(b*d*e*n - 6*a*d*e)*r^2 - 3*(4*b*d*e*n - 15*a*d*e)*r)*x^3)*x^r
)/(4*r^4 + 36*r^3 + 117*r^2 + 162*r + 81)
```

giac [B] time = 0.38, size = 746, normalized size = 7.10

$$\frac{12\,bd^2nr^4x^3\log(x)+72\,bdnr^3x^3x^re\log(x)-4\,bd^2nr^4x^3+12\,bd^2r^4x^3\log(c)+72\,bdr^3x^3x^re\log(c)+108\,bd^2nr^3x^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/9*(12*b*d^2*n*r^4*x^3*log(x) + 72*b*d*n*r^3*x^3*x^r*e*log(x) - 4*b*d^2*n*
r^4*x^3 + 12*b*d^2*r^4*x^3*log(c) + 72*b*d*r^3*x^3*x^r*e*log(c) + 108*b*d^2
*n*r^3*x^3*log(x) + 18*b*n*r^3*x^3*x^(2*r)*e^2*log(x) + 432*b*d*n*r^2*x^3*x
```

```
^r*e*log(x) - 36*b*d^2*n*r^3*x^3 + 12*a*d^2*r^4*x^3 - 72*b*d*n*r^2*x^3*x^r*
e + 72*a*d*r^3*x^3*x^r*e + 108*b*d^2*r^3*x^3*log(c) + 18*b*r^3*x^3*x^(2*r)*
e^2*log(c) + 432*b*d*r^2*x^3*x^r*e*log(c) + 351*b*d^2*n*r^2*x^3*log(x) + 13
5*b*n*r^2*x^3*x^(2*r)*e^2*log(x) + 810*b*d*n*r*x^3*x^r*e*log(x) - 117*b*d^2
*n*r^2*x^3 + 108*a*d^2*r^3*x^3 - 9*b*n*r^2*x^3*x^(2*r)*e^2 + 18*a*r^3*x^3*x
^(2*r)*e^2 - 216*b*d*n*r*x^3*x^r*e + 432*a*d*r^2*x^3*x^r*e + 351*b*d^2*r^2*
x^3*log(c) + 135*b*r^2*x^3*x^(2*r)*e^2*log(c) + 810*b*d*r*x^3*x^r*e*log(c)
+ 486*b*d^2*n*r*x^3*log(x) + 324*b*n*r*x^3*x^(2*r)*e^2*log(x) + 486*b*d*n*x
^3*x^r*e*log(x) - 162*b*d^2*n*r*x^3 + 351*a*d^2*r^2*x^3 - 54*b*n*r*x^3*x^(2
*r)*e^2 + 135*a*r^2*x^3*x^(2*r)*e^2 - 162*b*d*n*x^3*x^r*e + 810*a*d*r*x^3*x
^r*e + 486*b*d^2*r*x^3*log(c) + 324*b*r*x^3*x^(2*r)*e^2*log(c) + 486*b*d*x^
3*x^r*e*log(c) + 243*b*d^2*n*x^3*log(x) + 243*b*n*x^3*x^(2*r)*e^2*log(x) -
81*b*d^2*n*x^3 + 486*a*d^2*r*x^3 - 81*b*n*x^3*x^(2*r)*e^2 + 324*a*r*x^3*x^(
2*r)*e^2 + 486*a*d*x^3*x^r*e + 243*b*d^2*x^3*log(c) + 243*b*x^3*x^(2*r)*e^2
*log(c) + 243*a*d^2*x^3 + 243*a*x^3*x^(2*r)*e^2)/(4*r^4 + 36*r^3 + 117*r^2
+ 162*r + 81)
```

maple [C] time = 0.36, size = 1930, normalized size = 18.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+e*x^r)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/3*b*x^3*(3*e^2*(x^r)^2*r+2*d^2*r^2+12*d*e*r*x^r+9*(x^r)^2*e^2+9*d^2*r+18*
d*e*x^r+9*d^2)/(3+2*r)/(r+3)*ln(x^n)-1/18*x^3*(72*I*Pi*b*d*e*r^3*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*x^r-486*ln(c)*b*e^2*(x^r)^2-36*a*e^2*r^3*(x^r)^2-
972*a*d*e*x^r-270*a*e^2*r^2*(x^r)^2-648*a*e^2*r*(x^r)^2+162*b*e^2*n*(x^r)^2
-24*b*d^2*r^4*ln(c)-216*b*d^2*r^3*ln(c)-702*b*d^2*r^2*ln(c)-972*b*d^2*r*ln(
c)-486*a*d^2+8*b*d^2*n*r^4+72*b*d^2*n*r^3+162*b*d^2*n-486*a*e^2*(x^r)^2+486
*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+324*I*Pi*b*e^2*r*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-486*b*d^2*ln(c)-24*a*d^2*r^4+234*b*d^
2*n*r^2+324*b*d^2*n*r-702*a*d^2*r^2-972*a*d^2*r-216*a*d^2*r^3-324*I*Pi*b*e^
2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-486*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x
^n)^2*x^r-486*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+108*I*Pi*b*d^2*r^3*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-810*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*
c)*x^r-243*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+12*I*Pi*b*d^2*r^4*csgn(I*c*
x^n)^3+243*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+243*I*Pi*b*d^2*csgn(I*c*x^n)^
3+18*b*e^2*n*r^2*(x^r)^2-144*a*d*e*r^3*x^r-864*a*d*e*r^2*x^r-1620*a*d*e*r*x
^r+108*b*e^2*n*r*(x^r)^2+324*b*d*e*n*x^r-270*ln(c)*b*e^2*r^2*(x^r)^2-648*ln
(c)*b*e^2*r*(x^r)^2-972*b*d*e*x^r*ln(c)-36*ln(c)*b*e^2*r^3*(x^r)^2-351*I*Pi
*b*d^2*r^2*csgn(I*c)*csgn(I*c*x^n)^2-12*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn
(I*c)+324*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-243*I*Pi*b*e^2*csgn(I*x^n)*c
sgn(I*c*x^n)^2*(x^r)^2-108*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2+18*I*
Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2+432*b*d*e*n*r*x^r+144*b*d*e*n*r^2*x^r-
864*b*d*e*r^2*x^r*ln(c)-1620*b*d*e*r*x^r*ln(c)-144*b*d*e*r^3*x^r*ln(c)-324*
I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+486*I*Pi*b*d^2*r*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+810*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*x^r-108*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)+486*I*Pi*b*d*e*csgn(I
*c*x^n)^3*x^r+135*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-351*I*Pi*b*d^2*r^2
*csgn(I*x^n)*csgn(I*c*x^n)^2+351*I*Pi*b*d^2*r^2*csgn(I*c)*csgn(I*x^n)*csgn(
I*c*x^n)-18*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+810*I*Pi*b*d*e
*r*csgn(I*c*x^n)^3*x^r+243*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(
x^r)^2-135*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+432*I*Pi*b*d*e*
r^2*x^r*csgn(I*c*x^n)^3-135*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r
)^2-810*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-72*I*Pi*b*d*e*r^3*csgn
(I*x^n)*csgn(I*c*x^n)^2*x^r-243*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^
2+243*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-486*I*Pi*b*d^2*r*csgn(
I*c*x^n)^2*csgn(I*c)+72*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^r+12*I*Pi*b*d^2*r^
4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*
```

```
c*x^n)^2*(x^r)^2+135*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^
r)^2-72*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+18*I*Pi*b*e^2*r^3*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-486*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I
*c*x^n)^2-12*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-432*I*Pi*b*d*e*r^2*
x^r*csgn(I*x^n)*csgn(I*c*x^n)^2-432*I*Pi*b*d*e*r^2*x^r*csgn(I*c)*csgn(I*c*x
^n)^2-243*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+486*I*Pi*b*d^2*r*csgn(I*c*
x^n)^3+108*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^3+351*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^
3+432*I*Pi*b*d*e*r^2*x^r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n))/(3+2*r)^2/(r+
3)^2
```

maxima [A] time = 1.06, size = 152, normalized size = 1.45

$$-\frac{1}{9}\,bd^2nx^3+\frac{1}{3}\,bd^2x^3\log\left(cx^n\right)+\frac{1}{3}\,ad^2x^3+\frac{be^2x^{2\,r+3}\log\left(cx^n\right)}{2\,r+3}+\frac{2\,bdex^{r+3}\log\left(cx^n\right)}{r+3}-\frac{be^2nx^{2\,r+3}}{(2\,r+3)^2}+\frac{ae^2x^{2\,r+3}}{2\,r+3}-\frac{2\,bdenx^{r}}{(r+3)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/9*b*d^2*n*x^3 + 1/3*b*d^2*x^3*log(c*x^n) + 1/3*a*d^2*x^3 + b*e^2*x^(2*r
+ 3)*log(c*x^n)/(2*r + 3) + 2*b*d*e*x^(r + 3)*log(c*x^n)/(r + 3) - b*e^2*n*
x^(2*r + 3)/(2*r + 3)^2 + a*e^2*x^(2*r + 3)/(2*r + 3) - 2*b*d*e*n*x^(r + 3)
/(r + 3)^2 + 2*a*d*e*x^(r + 3)/(r + 3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^2\,\left(d+e\,x^r\right)^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d + e*x^r)^2*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^2*(d + e*x^r)^2*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.387 $\int (d+ex^r)^2 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=113

$$d^2x\left(a+b\log\left(cx^n\right)\right)+\frac{2dex^{r+1}\left(a+b\log\left(cx^n\right)\right)}{r+1}+\frac{e^2x^{2r+1}\left(a+b\log\left(cx^n\right)\right)}{2r+1}-bd^2nx-\frac{2bdenx^{r+1}}{(r+1)^2}-\frac{be^2nx^{2r+1}}{(2r+1)^2}$$

```
[Out] -b*d^2*n*x-2*b*d*e*n*x^(1+r)/(1+r)^2-b*e^2*n*x^(1+2*r)/(1+2*r)^2+d^2*x*(a+b
*ln(c*x^n))+2*d*e*x^(1+r)*(a+b*ln(c*x^n))/(1+r)+e^2*x^(1+2*r)*(a+b*ln(c*x^n
))/(1+2*r)
```

Rubi [A] time = 0.08, antiderivative size = 95, normalized size of antiderivative = 0.84, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {244, 2313}

$$\left(d^2x+\frac{2dex^{r+1}}{r+1}+\frac{e^2x^{2r+1}}{2r+1}\right)\left(a+b\log\left(cx^n\right)\right)-bd^2nx-\frac{2bdenx^{r+1}}{(r+1)^2}-\frac{be^2nx^{2r+1}}{(2r+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x) - (2*b*d*e*n*x^(1 + r))/(1 + r)^2 - (b*e^2*n*x^(1 + 2*r))/(1 +
 2*r)^2 + (d^2*x + (2*d*e*x^(1 + r))/(1 + r) + (e^2*x^(1 + 2*r))/(1 + 2*r))
*(a + b*Log[c*x^n])
```

Rule 244

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && IGtQ[p, 0]
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\int (d+ex^r)^2\left(a+b\log\left(cx^n\right)\right)dx=\left(d^2x+\frac{2dex^{1+r}}{1+r}+\frac{e^2x^{1+2r}}{1+2r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(d^2+\frac{2dex^r}{1+r}+\frac{e^2x^2}{1+2}\right.$$
$$=-bd^2nx-\frac{2bdenx^{1+r}}{(1+r)^2}-\frac{be^2nx^{1+2r}}{(1+2r)^2}+\left(d^2x+\frac{2dex^{1+r}}{1+r}+\frac{e^2x^{1+2r}}{1+2r}\right)\left(a+b\log\right.$$

Mathematica [A] time = 0.17, size = 107, normalized size = 0.95

$$x\left(\frac{2dex^r\left(a+b\log\left(cx^n\right)\right)}{r+1}+\frac{e^2x^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r+1}+ad^2+bd^2\log\left(cx^n\right)-bd^2n-\frac{2bdenx^r}{(r+1)^2}-\frac{be^2nx^{2r}}{(2r+1)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(a*d^2 - b*d^2*n - (2*b*d*e*n*x^r)/(1 + r)^2 - (b*e^2*n*x^(2*r))/(1 + 2*r
)^2 + b*d^2*Log[c*x^n] + (2*d*e*x^r*(a + b*Log[c*x^n]))/(1 + r) + (e^2*x^(2
*r)*(a + b*Log[c*x^n]))/(1 + 2*r))
```

fricas [B] time = 0.48, size = 466, normalized size = 4.12

$$\frac{\left(4\,bd^{2}r^{4}+12\,bd^{2}r^{3}+13\,bd^{2}r^{2}+6\,bd^{2}r+bd^{2}\right)x\log(c)+\left(4\,bd^{2}nr^{4}+12\,bd^{2}nr^{3}+13\,bd^{2}nr^{2}+6\,bd^{2}nr+bd^{2}n\right)x\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((4*b*d^2*r^4 + 12*b*d^2*r^3 + 13*b*d^2*r^2 + 6*b*d^2*r + b*d^2)*x*log(c) +
 (4*b*d^2*n*r^4 + 12*b*d^2*n*r^3 + 13*b*d^2*n*r^2 + 6*b*d^2*n*r + b*d^2*n)*
x*log(x) - (4*(b*d^2*n - a*d^2)*r^4 + b*d^2*n + 12*(b*d^2*n - a*d^2)*r^3 -
a*d^2 + 13*(b*d^2*n - a*d^2)*r^2 + 6*(b*d^2*n - a*d^2)*r)*x + ((2*b*e^2*r^3
 + 5*b*e^2*r^2 + 4*b*e^2*r + b*e^2)*x*log(c) + (2*b*e^2*n*r^3 + 5*b*e^2*n*r
^2 + 4*b*e^2*n*r + b*e^2*n)*x*log(x) + (2*a*e^2*r^3 - b*e^2*n + a*e^2 - (b*
e^2*n - 5*a*e^2)*r^2 - 2*(b*e^2*n - 2*a*e^2)*r)*x)*x^(2*r) + 2*((4*b*d*e*r^
3 + 8*b*d*e*r^2 + 5*b*d*e*r + b*d*e)*x*log(c) + (4*b*d*e*n*r^3 + 8*b*d*e*n*
r^2 + 5*b*d*e*n*r + b*d*e*n)*x*log(x) + (4*a*d*e*r^3 - b*d*e*n + a*d*e - 4*
(b*d*e*n - 2*a*d*e)*r^2 - (4*b*d*e*n - 5*a*d*e)*r)*x)*x^r)/(4*r^4 + 12*r^3
+ 13*r^2 + 6*r + 1)
```

giac [B] time = 0.36, size = 244, normalized size = 2.16

$$\frac{2\,bdnrxx^{r}e\log(x)}{r^{2}+2\,r+1}+bd^{2}nx\log(x)+\frac{2\,bnrxx^{2\,r}e^{2}\log(x)}{4\,r^{2}+4\,r+1}+\frac{2\,bdnxx^{r}e\log(x)}{r^{2}+2\,r+1}-bd^{2}nx-\frac{2\,bdnxx^{r}e}{r^{2}+2\,r+1}+bd^{2}x\log(c)+\frac{2\,bdx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 2*b*d*n*r*x*x^r*e*log(x)/(r^2 + 2*r + 1) + b*d^2*n*x*log(x) + 2*b*n*r*x*x^(
2*r)*e^2*log(x)/(4*r^2 + 4*r + 1) + 2*b*d*n*x*x^r*e*log(x)/(r^2 + 2*r + 1)
- b*d^2*n*x - 2*b*d*n*x*x^r*e/(r^2 + 2*r + 1) + b*d^2*x*log(c) + 2*b*d*x*x^
r*e*log(c)/(r + 1) + b*n*x*x^(2*r)*e^2*log(x)/(4*r^2 + 4*r + 1) + a*d^2*x -
 b*n*x*x^(2*r)*e^2/(4*r^2 + 4*r + 1) + 2*a*d*x*x^r*e/(r + 1) + b*x*x^(2*r)*
e^2*log(c)/(2*r + 1) + a*x*x^(2*r)*e^2/(2*r + 1)
```

maple [C] time = 0.34, size = 1921, normalized size = 17.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] b*x*(e^2*(x^r)^2*r+2*d^2*r^2+4*d*e*r*x^r+(x^r)^2*e^2+3*d^2*r+2*d*e*x^r+d^2)
/(1+2*r)/(r+1)*ln(x^n)-1/2*x*(8*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*x^r-2*ln(c)*b*e^2*(x^r)^2-4*a*e^2*r^3*(x^r)^2-4*a*d*e*x^r-10*a*e^2*
r^2*(x^r)^2-8*a*e^2*r*(x^r)^2+2*b*e^2*n*(x^r)^2-8*b*d^2*r^4*ln(c)-24*b*d^2*
r^3*ln(c)-26*b*d^2*r^2*ln(c)-12*b*d^2*r*ln(c)-2*a*d^2+8*b*d^2*n*r^4+24*b*d^
2*n*r^3+2*b*d^2*n-2*a*e^2*(x^r)^2-16*I*Pi*b*d*e*r^2*x^r*csgn(I*c)*csgn(I*c*
x^n)^2-2*b*d^2*ln(c)-8*a*d^2*r^4+26*b*d^2*n*r^2+12*b*d^2*n*r-26*a*d^2*r^2-1
2*a*d^2*r-24*a*d^2*r^3-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d^2*cs
gn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3+13*I*Pi*b*d^2*r^2*
csgn(I*c*x^n)^3-6*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-4*I*Pi*b*d^2*r^4
*csgn(I*x^n)*csgn(I*c*x^n)^2+16*I*Pi*b*d*e*r^2*x^r*csgn(I*c)*csgn(I*x^n)*cs
gn(I*c*x^n)+2*b*e^2*n*r^2*(x^r)^2-16*a*d*e*r^3*x^r-32*a*d*e*r^2*x^r-20*a*d*
e*r*x^r+4*b*e^2*n*r*(x^r)^2+4*b*d*e*n*x^r-10*ln(c)*b*e^2*r^2*(x^r)^2-8*ln(c
)*b*e^2*r*(x^r)^2-4*b*d*e*x^r*ln(c)-4*ln(c)*b*e^2*r^3*(x^r)^2-4*I*Pi*b*d^2*
r^4*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+16*b*d*e*n*r*x^r+16*b*d*e*n*r^2*x^r-32*b*d*e*r^2*x^r*ln(c)-20*b*d*e*r*x^r
*ln(c)-16*b*d*e*r^3*x^r*ln(c)+10*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csg
```

```
n(I*c)*x^r+I*Pi*b*d^2*csgn(I*c*x^n)^3-8*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c
*x^n)^2*x^r-8*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2*I*Pi*b*e^2*r^3
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+6*I*Pi*b*d^2*r*csgn(I*c*x^n)^3
+12*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^3+I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2-12*I*
Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+4*I
*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+8*I*Pi*b*d*e*r^3*csgn(I*c
*x^n)^3*x^r+2*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-5*I*Pi*b*e
^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+16*I*Pi*b*d*e*r^2*x^r*csgn(I*c*x^n
)^3-5*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-4*I*Pi*b*e^2*r*csg
n(I*c*x^n)^2*csgn(I*c)*(x^r)^2-2*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r
-2*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+10*I*Pi*b*d*e*r*csgn(I*
c*x^n)^3*x^r-4*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+6*I*Pi*b*d^
2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)*(x^r)^2-2*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-2*
I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+12*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)+13*I*Pi*b*d^2*r^2*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-1
3*I*Pi*b*d^2*r^2*csgn(I*c)*csgn(I*c*x^n)^2+5*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3
*(x^r)^2+4*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+5*I*Pi*b*e^2*r^2*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-16*I*Pi*b*d*e*r^2*x^r*csgn(I*x^n)*csgn(I*
c*x^n)^2-12*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-13*I*Pi*b*d^2*r^2*cs
gn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-I*Pi*b*e
^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-6*I*Pi*b*d^2*r*csgn(I*c*x^n)^2*csgn(I*
c)-I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+4*I*Pi*b*e^2*r*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-10*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)
^2*x^r-10*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r)/(1+2*r)^2/(r+1)^2
```

maxima [A] time = 1.02, size = 144, normalized size = 1.27

$$-bd^2nx+bd^2x\log(cx^n)+ad^2x+\frac{be^2x^{2r+1}\log(cx^n)}{2r+1}+\frac{2bdex^{r+1}\log(cx^n)}{r+1}-\frac{be^2nx^{2r+1}}{(2r+1)^2}+\frac{ae^2x^{2r+1}}{2r+1}-\frac{2bdenx^{r+1}}{(r+1)^2}+\frac{2a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -b*d^2*n*x + b*d^2*x*log(c*x^n) + a*d^2*x + b*e^2*x^(2*r + 1)*log(c*x^n)/(2
*r + 1) + 2*b*d*e*x^(r + 1)*log(c*x^n)/(r + 1) - b*e^2*n*x^(2*r + 1)/(2*r +
 1)^2 + a*e^2*x^(2*r + 1)/(2*r + 1) - 2*b*d*e*n*x^(r + 1)/(r + 1)^2 + 2*a*d
*e*x^(r + 1)/(r + 1)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (d+e\,x^r)^2\,\left(a+b\,\ln(c\,x^n)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^r)^2*(a + b*log(c*x^n)),x)
```

```
[Out] int((d + e*x^r)^2*(a + b*log(c*x^n)), x)
```

sympy [A] time = 13.92, size = 211, normalized size = 1.87

$$ad^2x+2ade\left(\begin{cases}\frac{x^{r+1}}{r+1} & \text{for } r\neq -1\\ \log(x) & \text{otherwise}\end{cases}\right)+ae^2\left(\begin{cases}\frac{x^{2r+1}}{2r+1} & \text{for } 2r\neq -1\\ \log(x) & \text{otherwise}\end{cases}\right)-bd^2nx+bd^2x\log(cx^n)-2bden\left(\begin{cases}\frac{\begin{cases}\frac{xx^r}{r+1} \\ \log(x)\end{cases}}{r} \\ \frac{\log(x)^2}{2}\end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x + 2*a*d*e*Piecewise((x**(r + 1)/(r + 1), Ne(r, -1)), (log(x), True
)) + a*e**2*Piecewise((x**(2*r + 1)/(2*r + 1), Ne(2*r, -1)), (log(x), True)
) - b*d**2*n*x + b*d**2*x*log(c*x**n) - 2*b*d*e*n*Piecewise((Piecewise((x*x
**r/(r + 1), Ne(r, -1)), (log(x), True))/(r + 1), (r > -oo) & (r < oo) & Ne
(r, -1)), (log(x)**2/2, True)) + 2*b*d*e*Piecewise((x**(r + 1)/(r + 1), Ne(
r, -1)), (log(x), True))*log(c*x**n) - b*e**2*n*Piecewise((Piecewise((x*x**
(2*r)/(2*r + 1), Ne(r, -1/2)), (log(x), True))/(2*r + 1), (r > -oo) & (r <
oo) & Ne(r, -1/2)), (log(x)**2/2, True)) + b*e**2*Piecewise((x**(2*r + 1)/(
2*r + 1), Ne(2*r, -1)), (log(x), True))*log(c*x**n)
```

3.388 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=123

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{2dex^{r-1}\left(a+b\log\left(cx^n\right)\right)}{1-r}-\frac{e^2x^{2r-1}\left(a+b\log\left(cx^n\right)\right)}{1-2r}-\frac{bd^2n}{x}-\frac{2bdenx^{r-1}}{(1-r)^2}-\frac{be^2nx^{2r-1}}{(1-2r)^2}$$

```
[Out] -b*d^2*n/x-2*b*d*e*n*x^(-1+r)/(1-r)^2-b*e^2*n*x^(-1+2*r)/(1-2*r)^2-d^2*(a+b
*ln(c*x^n))/x-2*d*e*x^(-1+r)*(a+b*ln(c*x^n))/(1-r)-e^2*x^(-1+2*r)*(a+b*ln(c
*x^n))/(1-2*r)
```

Rubi [A] time = 0.17, antiderivative size = 104, normalized size of antiderivative = 0.85, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {270, 2334, 14}

$$-\left(\frac{d^2}{x}+\frac{2dex^{r-1}}{1-r}+\frac{e^2x^{2r-1}}{1-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{x}-\frac{2bdenx^{r-1}}{(1-r)^2}-\frac{be^2nx^{2r-1}}{(1-2r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^2*n)/x) - (2*b*d*e*n*x^(-1 + r))/(1 - r)^2 - (b*e^2*n*x^(-1 + 2*r))/
(1 - 2*r)^2 - (d^2/x + (2*d*e*x^(-1 + r))/(1 - r) + (e^2*x^(-1 + 2*r))/(1 -
 2*r))*(a + b*Log[c*x^n])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^r)^2\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx &= -\left(\frac{d^2}{x}+\frac{2dex^{-1+r}}{1-r}+\frac{e^2x^{-1+2r}}{1-2r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-d^2+\frac{2dex^r}{-1+r}+\frac{e^2}{-1}}{x^2}\\ &= -\left(\frac{d^2}{x}+\frac{2dex^{-1+r}}{1-r}+\frac{e^2x^{-1+2r}}{1-2r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(-\frac{d^2}{x^2}+\frac{2dex^{-2+}}{-1+r}\right.\\ &= -\frac{bd^2n}{x}-\frac{2bdenx^{-1+r}}{(1-r)^2}-\frac{be^2nx^{-1+2r}}{(1-2r)^2}-\left(\frac{d^2}{x}+\frac{2dex^{-1+r}}{1-r}+\frac{e^2x^{-1+2r}}{1-2r}\right)\left(a+b1\right.\end{aligned}$$

Mathematica [A] time = 0.30, size = 121, normalized size = 0.98

$$\frac{a\left(-d^2+\frac{2dex^r}{r-1}+\frac{e^2x^{2r}}{2r-1}\right)+b\log\left(cx^n\right)\left(-d^2+\frac{2dex^r}{r-1}+\frac{e^2x^{2r}}{2r-1}\right)+bn\left(-d^2-\frac{2dex^r}{(r-1)^2}-\frac{e^2x^{2r}}{(1-2r)^2}\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] (b*n*(-d^2 - (2*d*e*x^r)/(-1 + r)^2 - (e^2*x^(2*r))/(1 - 2*r)^2) + a*(-d^2
+ (2*d*e*x^r)/(-1 + r) + (e^2*x^(2*r))/(-1 + 2*r)) + b*(-d^2 + (2*d*e*x^r)/
(-1 + r) + (e^2*x^(2*r))/(-1 + 2*r))*Log[c*x^n])/x
```

fricas [B] time = 0.47, size = 455, normalized size = 3.70

$$-\frac{4\left(bd^2n+ad^2\right)r^4+bd^2n-12\left(bd^2n+ad^2\right)r^3+ad^2+13\left(bd^2n+ad^2\right)r^2-6\left(bd^2n+ad^2\right)r-\left(2\,ae^2r^3-be^2n-a\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -(4*(b*d^2*n + a*d^2)*r^4 + b*d^2*n - 12*(b*d^2*n + a*d^2)*r^3 + a*d^2 + 13
*(b*d^2*n + a*d^2)*r^2 - 6*(b*d^2*n + a*d^2)*r - (2*a*e^2*r^3 - b*e^2*n - a
*e^2 - (b*e^2*n + 5*a*e^2)*r^2 + 2*(b*e^2*n + 2*a*e^2)*r + (2*b*e^2*r^3 - 5
*b*e^2*r^2 + 4*b*e^2*r - b*e^2)*log(c) + (2*b*e^2*n*r^3 - 5*b*e^2*n*r^2 + 4
*b*e^2*n*r - b*e^2*n)*log(x))*x^(2*r) - 2*(4*a*d*e*r^3 - b*d*e*n - a*d*e -
4*(b*d*e*n + 2*a*d*e)*r^2 + (4*b*d*e*n + 5*a*d*e)*r + (4*b*d*e*r^3 - 8*b*d*
e*r^2 + 5*b*d*e*r - b*d*e)*log(c) + (4*b*d*e*n*r^3 - 8*b*d*e*n*r^2 + 5*b*d*
e*n*r - b*d*e*n)*log(x))*x^r + (4*b*d^2*r^4 - 12*b*d^2*r^3 + 13*b*d^2*r^2 -
 6*b*d^2*r + b*d^2)*log(c) + (4*b*d^2*n*r^4 - 12*b*d^2*n*r^3 + 13*b*d^2*n*r
^2 - 6*b*d^2*n*r + b*d^2*n)*log(x))/((4*r^4 - 12*r^3 + 13*r^2 - 6*r + 1)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(ex^r+d\right)^2\left(b\log\left(cx^n\right)+a\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^2, x)
```

maple [C] time = 0.33, size = 1927, normalized size = 15.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(b*ln(c*x^n)+a)/x^2,x)
```

```
[Out] -b*(-e^2*(x^r)^2*r+2*d^2*r^2-4*d*e*r*x^r+(x^r)^2*e^2-3*d^2*r+2*d*e*x^r+d^2)
/x/(-1+2*r)/(r-1)*ln(x^n)-1/2*(8*I*Pi*b*d*e*r^3*x^r*csgn(I*c)*csgn(I*x^n)*c
sgn(I*c*x^n)+2*ln(c)*b*e^2*(x^r)^2-4*a*e^2*r^3*(x^r)^2+4*a*d*e*x^r+10*a*e^2
*r^2*(x^r)^2-8*a*e^2*r*(x^r)^2+2*b*e^2*n*(x^r)^2+8*b*d^2*r^4*ln(c)-24*b*d^2
*r^3*ln(c)+26*b*d^2*r^2*ln(c)-12*b*d^2*r*ln(c)+2*a*d^2+8*b*d^2*n*r^4-24*b*d
^2*n*r^3+2*b*d^2*n+2*a*e^2*(x^r)^2+I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^
r)^2+I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+4*I*Pi*b*d^2*r^4*csgn(I
*x^n)*csgn(I*c*x^n)^2+2*b*d^2*ln(c)+8*a*d^2*r^4+26*b*d^2*n*r^2-12*b*d^2*n*r
+26*a*d^2*r^2-12*a*d^2*r-24*a*d^2*r^3+5*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c
```

```
*x^n)^2*(x^r)^2-2*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-5*I*Pi
*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+16*I*Pi*b*d*e*r^2*x^
r*csgn(I*c)*csgn(I*c*x^n)^2-5*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2+16*I*P
i*b*d*e*r^2*x^r*csgn(I*x^n)*csgn(I*c*x^n)^2-16*I*Pi*b*d*e*r^2*x^r*csgn(I*c)
*csgn(I*x^n)*csgn(I*c*x^n)-6*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2+2*b*e
^2*n*r^2*(x^r)^2-16*a*d*e*r^3*x^r+32*a*d*e*r^2*x^r-20*a*d*e*r*x^r-4*b*e^2*n
*r*(x^r)^2+4*b*d*e*n*x^r+10*ln(c)*b*e^2*r^2*(x^r)^2-8*ln(c)*b*e^2*r*(x^r)^2
+4*b*d*e*x^r*ln(c)-4*ln(c)*b*e^2*r^3*(x^r)^2-16*b*d*e*n*r*x^r+16*b*d*e*n*r^
2*x^r+32*b*d*e*r^2*x^r*ln(c)-20*b*d*e*r*x^r*ln(c)-16*b*d*e*r^3*x^r*ln(c)+13
*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)+13*I*Pi*b*d^2*r^2*csgn(I*c)*csgn(I*c*x^n)^2+10*I*Pi*b*d*e*r
*x^r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2
+I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c
)-8*I*Pi*b*d*e*r^3*x^r*csgn(I*x^n)*csgn(I*c*x^n)^2-8*I*Pi*b*d*e*r^3*x^r*csg
n(I*c)*csgn(I*c*x^n)^2+2*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*(x^r)^2+6*I*Pi*b*d^2*r*csgn(I*c*x^n)^3+12*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^3+4
*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+
5*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-16*I*Pi*b*d*e*r^2*x^r*cs
gn(I*c*x^n)^3-13*I*Pi*b*d^2*r^2*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-12*I*Pi
*b*d^2*r^3*csgn(I*c)*csgn(I*c*x^n)^2+8*I*Pi*b*d*e*r^3*x^r*csgn(I*c*x^n)^3-4
*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-2*I*Pi*b*e^2*r^3*csgn(I*c*x
^n)^2*csgn(I*c)*(x^r)^2+10*I*Pi*b*d*e*r*x^r*csgn(I*c*x^n)^3-4*I*Pi*b*e^2*r*
csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+6*I*Pi*b*d^2*r*csgn(I*c)*csgn(I*x^n)*cs
gn(I*c*x^n)-2*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+12*I*Pi*b*
d^2*r^3*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-I*Pi*b*d^2*csgn(I*c*x^n)^3-13*I
*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+4*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+2*I*Pi
*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+2*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*
c)*x^r-4*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*e^2*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-12*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(
I*c*x^n)^2+2*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-6*I*Pi*b*d^2*r*csgn(I*c
)*csgn(I*c*x^n)^2+4*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^
2-10*I*Pi*b*d*e*r*x^r*csgn(I*x^n)*csgn(I*c*x^n)^2-10*I*Pi*b*d*e*r*x^r*csgn(
I*c)*csgn(I*c*x^n)^2-4*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3)/(-1+2*r)^2/x/(r-1)^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-2>0)', see `assume?` for more det
ails)Is r-2 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^r)^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^2,x)
```

```
[Out] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^2, x)
```

sympy [A] time = 36.63, size = 204, normalized size = 1.66

$$-\frac{ad^2}{x}+2ade\left(\begin{cases}\frac{x^r}{rx-x} & \text{for } r\neq 1\\ \log(x) & \text{otherwise}\end{cases}\right)+ae^2\left(\begin{cases}\frac{x^{2r}}{2rx-x} & \text{for } r\neq \frac{1}{2}\\ \log(x) & \text{otherwise}\end{cases}\right)-\frac{bd^2n}{x}-\frac{bd^2\log(cx^n)}{x}-2bden\left(\begin{cases}\frac{\begin{cases}\frac{x^r}{rx-x} & \text{for } r\\ \log(x) & \text{othe}\end{cases}}{r-1} \\ \frac{\log(x)^2}{2}\end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] -a*d**2/x + 2*a*d*e*Piecewise((x**r/(r*x - x), Ne(r, 1)), (log(x), True)) +
 a*e**2*Piecewise((x**(2*r)/(2*r*x - x), Ne(r, 1/2)), (log(x), True)) - b*d
**2*n/x - b*d**2*log(c*x**n)/x - 2*b*d*e*n*Piecewise((Piecewise((x**r/(r*x
- x), Ne(r, 1)), (log(x), True))/(r - 1), (r > -oo) & (r < oo) & Ne(r, 1)),
 (log(x)**2/2, True)) + 2*b*d*e*Piecewise((x**(r - 1)/(r - 1), Ne(r - 2, -1
)), (log(x), True))*log(c*x**n) - b*e**2*n*Piecewise((Piecewise((x**(2*r)/(
2*r*x - x), Ne(r, 1/2)), (log(x), True))/(2*r - 1), (r > -oo) & (r < oo) &
Ne(r, 1/2)), (log(x)**2/2, True)) + b*e**2*Piecewise((x**(2*r - 1)/(2*r - 1
), Ne(2*r - 2, -1)), (log(x), True))*log(c*x**n)
```

3.389 $\int \frac{(d+ex^r)^2\left(a+b\log(cx^n)\right)}{x^4}\,dx$

Optimal. Leaf size=127

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{2dex^{r-3}\left(a+b\log\left(cx^n\right)\right)}{3-r}-\frac{e^2x^{2r-3}\left(a+b\log\left(cx^n\right)\right)}{3-2r}-\frac{bd^2n}{9x^3}-\frac{2bdenx^{r-3}}{(3-r)^2}-\frac{be^2nx^{2r-3}}{(3-2r)^2}$$

```
[Out] -1/9*b*d^2*n/x^3-2*b*d*e*n*x^(-3+r)/(3-r)^2-b*e^2*n*x^(-3+2*r)/(3-2*r)^2-1/
3*d^2*(a+b*ln(c*x^n))/x^3-2*d*e*x^(-3+r)*(a+b*ln(c*x^n))/(3-r)-e^2*x^(-3+2*
r)*(a+b*ln(c*x^n))/(3-2*r)
```

Rubi [A] time = 0.17, antiderivative size = 109, normalized size of antiderivative = 0.86, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6dex^{r-3}}{3-r}+\frac{3e^2x^{2r-3}}{3-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{9x^3}-\frac{2bdenx^{r-3}}{(3-r)^2}-\frac{be^2nx^{2r-3}}{(3-2r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^2*n)/(9*x^3) - (2*b*d*e*n*x^(-3 + r))/(3 - r)^2 - (b*e^2*n*x^(-3 + 2*
r))/(3 - 2*r)^2 - ((d^2/x^3 + (6*d*e*x^(-3 + r))/(3 - r) + (3*e^2*x^(-3 + 2
*r))/(3 - 2*r))*(a + b*Log[c*x^n]))/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^2\left(a+b\log\left(cx^n\right)\right)}{x^4}\,dx = -\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6dex^{-3+r}}{3-r}+\frac{3e^2x^{-3+2r}}{3-2r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-d^2+\frac{6dex^r}{-3+r}+\frac{3e^2}{-3}}{3x^4}$$

$$= -\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6dex^{-3+r}}{3-r}+\frac{3e^2x^{-3+2r}}{3-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}(bn)\int \frac{-d^2+\frac{6dex^r}{-3+r}+}{x^4}$$

$$= -\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6dex^{-3+r}}{3-r}+\frac{3e^2x^{-3+2r}}{3-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}(bn)\int\left(-\frac{d^2}{x^4}+\frac{6dex^{-}}{-3+}\right.$$

$$= -\frac{bd^2n}{9x^3}-\frac{2bdenx^{-3+r}}{(3-r)^2}-\frac{be^2nx^{-3+2r}}{(3-2r)^2}-\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6dex^{-3+r}}{3-r}+\frac{3e^2x^{-3+2r}}{3-2r}\right)\left(a+b\right.$$

Mathematica [A] time = 0.31, size = 127, normalized size = 1.00

$$\frac{a\left(-3d^2+\frac{18dex^r}{r-3}+\frac{9e^2x^{2r}}{2r-3}\right)+3b\log\left(cx^n\right)\left(-d^2+\frac{6dex^r}{r-3}+\frac{3e^2x^{2r}}{2r-3}\right)+bn\left(-d^2-\frac{18dex^r}{(r-3)^2}-\frac{9e^2x^{2r}}{(3-2r)^2}\right)}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] (b*n*(-d^2 - (18*d*e*x^r)/(-3 + r)^2 - (9*e^2*x^(2*r))/(3 - 2*r)^2) + a*(-3
*d^2 + (18*d*e*x^r)/(-3 + r) + (9*e^2*x^(2*r))/(-3 + 2*r)) + 3*b*(-d^2 + (6
*d*e*x^r)/(-3 + r) + (3*e^2*x^(2*r))/(-3 + 2*r))*Log[c*x^n])/(9*x^3)
```

fricas [B] time = 0.46, size = 466, normalized size = 3.67

$$-\frac{4\left(bd^2n+3\,ad^2\right)r^4+81\,bd^2n-36\left(bd^2n+3\,ad^2\right)r^3+243\,ad^2+117\left(bd^2n+3\,ad^2\right)r^2-162\left(bd^2n+3\,ad^2\right)r-9}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(4*(b*d^2*n + 3*a*d^2)*r^4 + 81*b*d^2*n - 36*(b*d^2*n + 3*a*d^2)*r^3 +
 243*a*d^2 + 117*(b*d^2*n + 3*a*d^2)*r^2 - 162*(b*d^2*n + 3*a*d^2)*r - 9*(2
*a*e^2*r^3 - 9*b*e^2*n - 27*a*e^2 - (b*e^2*n + 15*a*e^2)*r^2 + 6*(b*e^2*n +
 6*a*e^2)*r + (2*b*e^2*r^3 - 15*b*e^2*r^2 + 36*b*e^2*r - 27*b*e^2)*log(c) +
 (2*b*e^2*n*r^3 - 15*b*e^2*n*r^2 + 36*b*e^2*n*r - 27*b*e^2*n)*log(x))*x^(2*
r) - 18*(4*a*d*e*r^3 - 9*b*d*e*n - 27*a*d*e - 4*(b*d*e*n + 6*a*d*e)*r^2 + 3
*(4*b*d*e*n + 15*a*d*e)*r + (4*b*d*e*r^3 - 24*b*d*e*r^2 + 45*b*d*e*r - 27*b
*d*e)*log(c) + (4*b*d*e*n*r^3 - 24*b*d*e*n*r^2 + 45*b*d*e*n*r - 27*b*d*e*n)
*log(x))*x^r + 3*(4*b*d^2*r^4 - 36*b*d^2*r^3 + 117*b*d^2*r^2 - 162*b*d^2*r
+ 81*b*d^2)*log(c) + 3*(4*b*d^2*n*r^4 - 36*b*d^2*n*r^3 + 117*b*d^2*n*r^2 -
162*b*d^2*n*r + 81*b*d^2*n)*log(x))/((4*r^4 - 36*r^3 + 117*r^2 - 162*r + 81
)*x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r+d)^2\left(b\log\left(cx^n\right)+a\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^4, x)
```

maple [C] time = 0.35, size = 1930, normalized size = 15.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(b*ln(c*x^n)+a)/x^4,x)
```

```
[Out] -1/3*b*(-3*e^2*(x^r)^2*r+2*d^2*r^2-12*d*e*r*x^r+9*(x^r)^2*e^2-9*d^2*r+18*d*
e*x^r+9*d^2)/x^3/(-3+2*r)/(r-3)*ln(x^n)-1/18*(72*I*Pi*b*d*e*r^3*x^r*csgn(I*
c)*csgn(I*x^n)*csgn(I*c*x^n)+351*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)+4
86*ln(c)*b*e^2*(x^r)^2-36*a*e^2*r^3*(x^r)^2+972*a*d*e*x^r+270*a*e^2*r^2*(x^
r)^2-648*a*e^2*r*(x^r)^2+162*b*e^2*n*(x^r)^2+24*b*d^2*r^4*ln(c)-216*b*d^2*r
^3*ln(c)+702*b*d^2*r^2*ln(c)-972*b*d^2*r*ln(c)+486*a*d^2+8*b*d^2*n*r^4-72*b
*d^2*n*r^3+162*b*d^2*n+486*a*e^2*(x^r)^2+324*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*(x^r)^2+486*b*d^2*ln(c)+24*a*d^2*r^4+234*b*d^2*n*r^2-324
*b*d^2*n*r+702*a*d^2*r^2-972*a*d^2*r-216*a*d^2*r^3-243*I*Pi*b*d^2*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-135*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*(x^r)^2+243*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-12*I*Pi*b*d^2*r^4*c
sgn(I*c*x^n)^3-135*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-324*I*Pi*b*e^2*r*
csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+108*I*Pi*b*d^2*r^3*csgn(I*c)*csgn(I*x^n)*
csgn(I*c*x^n)-810*I*Pi*b*d*e*r*x^r*csgn(I*c)*csgn(I*c*x^n)^2-432*I*Pi*b*d*e
*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+18*b*e^2*n*r^2*(x^r)^2-144*a*d
*e*r^3*x^r+864*a*d*e*r^2*x^r-1620*a*d*e*r*x^r-108*b*e^2*n*r*(x^r)^2+324*b*d
*e*n*x^r+270*ln(c)*b*e^2*r^2*(x^r)^2-648*ln(c)*b*e^2*r*(x^r)^2+972*b*d*e*x^
r*ln(c)-36*ln(c)*b*e^2*r^3*(x^r)^2+324*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2
-108*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2+18*I*Pi*b*e^2*r^3*csgn(I*c*
x^n)^3*(x^r)^2-432*b*d*e*n*r*x^r+144*b*d*e*n*r^2*x^r+864*b*d*e*r^2*x^r*ln(c
)-1620*b*d*e*r*x^r*ln(c)-144*b*d*e*r^3*x^r*ln(c)+432*I*Pi*b*d*e*r^2*csgn(I*
c*x^n)^2*csgn(I*c)*x^r-486*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x
^r+432*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-324*I*Pi*b*e^2*r*csgn
(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+486*I*Pi*b*d^2*r*csgn(I*c)*csgn(I*x^n)*csgn
(I*c*x^n)+243*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+810*I*Pi*b*d*e*r
*x^r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-108*I*Pi*b*d^2*r^3*csgn(I*c)*csgn(
I*c*x^n)^2+243*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-18*I*Pi*b*e^2
*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+810*I*Pi*b*d*e*r*x^r*csgn(I*c*x^n)^3
-243*I*Pi*b*d^2*csgn(I*c*x^n)^3-810*I*Pi*b*d*e*r*x^r*csgn(I*x^n)*csgn(I*c*x
^n)^2-72*I*Pi*b*d*e*r^3*x^r*csgn(I*x^n)*csgn(I*c*x^n)^2-486*I*Pi*b*d^2*r*cs
gn(I*c)*csgn(I*c*x^n)^2+72*I*Pi*b*d*e*r^3*x^r*csgn(I*c*x^n)^3-18*I*Pi*b*e^2
*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-72*I*Pi*b*d*e*r^3*x^r*csgn(I*c)*cs
gn(I*c*x^n)^2+18*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2
-486*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-243*I*Pi*b*e^2*csgn(I*c*x^n)^
3*(x^r)^2-351*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+243*I*Pi*b*d^2*csgn(I*x^n)*csg
n(I*c*x^n)^2+351*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+135*I*Pi*b*e^2*
r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+486*I*Pi*b*d^2*r*csgn(I*c*x^n)^3+10
8*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^3-12*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)-243*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+486*
I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+486*I*Pi*b*d*e*csgn(I*c*x^n)^2*c
sgn(I*c)*x^r+135*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-432*I*Pi*
b*d*e*r^2*csgn(I*c*x^n)^3*x^r-351*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+12*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+12*I*Pi*b*d^2*r^4*c
sgn(I*c*x^n)^2*csgn(I*c)-486*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r)/(-3+2*r)^2/x^3
/(r-3)^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-4>0)', see `assume?` for more det
ails)Is r-4 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d + e\,x^r)^2\ (a + b\ \ln(c\,x^n))}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^4,x)
```

```
[Out] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^4, x)
```

sympy [A] time = 93.83, size = 235, normalized size = 1.85

$$-\frac{ad^2}{3x^3}+2ade\left(\begin{cases}\frac{x^r}{rx^3-3x^3} & \text{for } r\neq 3\\ \log(x) & \text{otherwise}\end{cases}\right)+ae^2\left(\begin{cases}\frac{x^{2r}}{2rx^3-3x^3} & \text{for } r\neq \frac{3}{2}\\ \log(x) & \text{otherwise}\end{cases}\right)-\frac{bd^2n}{9x^3}-\frac{bd^2\log(cx^n)}{3x^3}-2bden\left(\begin{cases}\frac{\begin{cases}\frac{x^r}{rx^3-3x^3} & \text{for } r\neq 3\\ \log(x) & \text{otherwise}\end{cases}}{r-3} & \\ \frac{\log(x)^2}{2} & \end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d**2/(3*x**3) + 2*a*d*e*Piecewise((x**r/(r*x**3 - 3*x**3), Ne(r, 3)), (l
og(x), True)) + a*e**2*Piecewise((x**(2*r)/(2*r*x**3 - 3*x**3), Ne(r, 3/2))
, (log(x), True)) - b*d**2*n/(9*x**3) - b*d**2*log(c*x**n)/(3*x**3) - 2*b*d
*e*n*Piecewise((Piecewise((x**r/(r*x**3 - 3*x**3), Ne(r, 3)), (log(x), True
))/(r - 3), (r > -oo) & (r < oo) & Ne(r, 3)), (log(x)**2/2, True)) + 2*b*d*
e*Piecewise((x**(r - 3)/(r - 3), Ne(r - 4, -1)), (log(x), True))*log(c*x**n
) - b*e**2*n*Piecewise((Piecewise((x**(2*r)/(2*r*x**3 - 3*x**3), Ne(r, 3/2)
), (log(x), True))/(2*r - 3), (r > -oo) & (r < oo) & Ne(r, 3/2)), (log(x)**
2/2, True)) + b*e**2*Piecewise((x**(2*r - 3)/(2*r - 3), Ne(2*r - 4, -1)), (
log(x), True))*log(c*x**n)
```

3.390 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=127

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{2dex^{r-5}\left(a+b\log\left(cx^n\right)\right)}{5-r}-\frac{e^2x^{2r-5}\left(a+b\log\left(cx^n\right)\right)}{5-2r}-\frac{bd^2n}{25x^5}-\frac{2bdenx^{r-5}}{(5-r)^2}-\frac{be^2nx^{2r-5}}{(5-2r)^2}$$

```
[Out] -1/25*b*d^2*n/x^5-2*b*d*e*n*x^(-5+r)/(5-r)^2-b*e^2*n*x^(-5+2*r)/(5-2*r)^2-1
/5*d^2*(a+b*ln(c*x^n))/x^5-2*d*e*x^(-5+r)*(a+b*ln(c*x^n))/(5-r)-e^2*x^(-5+2
*r)*(a+b*ln(c*x^n))/(5-2*r)
```

Rubi [A] time = 0.17, antiderivative size = 109, normalized size of antiderivative = 0.86, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{5}\left(\frac{d^2}{x^5}+\frac{10dex^{r-5}}{5-r}+\frac{5e^2x^{2r-5}}{5-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{25x^5}-\frac{2bdenx^{r-5}}{(5-r)^2}-\frac{be^2nx^{2r-5}}{(5-2r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d^2*n)/(25*x^5) - (2*b*d*e*n*x^(-5 + r))/(5 - r)^2 - (b*e^2*n*x^(-5 + 2
*r))/(5 - 2*r)^2 - ((d^2/x^5 + (10*d*e*x^(-5 + r))/(5 - r) + (5*e^2*x^(-5 +
 2*r))/(5 - 2*r))*(a + b*Log[c*x^n]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^2\left(a+b\log\left(cx^n\right)\right)}{x^6}\,dx = -\frac{1}{5}\left(\frac{d^2}{x^5}+\frac{10dex^{-5+r}}{5-r}+\frac{5e^2x^{-5+2r}}{5-2r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-d^2+\frac{10dex^r}{-5+r}+\cdots}{5x^6}$$

$$= -\frac{1}{5}\left(\frac{d^2}{x^5}+\frac{10dex^{-5+r}}{5-r}+\frac{5e^2x^{-5+2r}}{5-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{5}(bn)\int \frac{-d^2+\frac{10dex^r}{-5+r}\cdots}{x^6}$$

$$= -\frac{1}{5}\left(\frac{d^2}{x^5}+\frac{10dex^{-5+r}}{5-r}+\frac{5e^2x^{-5+2r}}{5-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{5}(bn)\int \left(-\frac{d^2}{x^6}+\frac{10dex\cdots}{-5\cdots}\right.$$

$$= -\frac{bd^2n}{25x^5}-\frac{2bdenx^{-5+r}}{(5-r)^2}-\frac{be^2nx^{-5+2r}}{(5-2r)^2}-\frac{1}{5}\left(\frac{d^2}{x^5}+\frac{10dex^{-5+r}}{5-r}+\frac{5e^2x^{-5+2r}}{5-2r}\right)\left(a+b\cdots\right.$$

Mathematica [A] time = 0.31, size = 127, normalized size = 1.00

$$\frac{a\left(-5d^2+\frac{50dex^r}{r-5}+\frac{25e^2x^{2r}}{2r-5}\right)+5b\log\left(cx^n\right)\left(-d^2+\frac{10dex^r}{r-5}+\frac{5e^2x^{2r}}{2r-5}\right)+bn\left(-d^2-\frac{50dex^r}{(r-5)^2}-\frac{25e^2x^{2r}}{(5-2r)^2}\right)}{25x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] (b*n*(-d^2 - (50*d*e*x^r)/(-5 + r)^2 - (25*e^2*x^(2*r))/(5 - 2*r)^2) + a*(-
5*d^2 + (50*d*e*x^r)/(-5 + r) + (25*e^2*x^(2*r))/(-5 + 2*r)) + 5*b*(-d^2 +
(10*d*e*x^r)/(-5 + r) + (5*e^2*x^(2*r))/(-5 + 2*r))*Log[c*x^n])/(25*x^5)
```

fricas [B] time = 0.48, size = 466, normalized size = 3.67

$$-\frac{4\left(bd^2n+5\,ad^2\right)r^4+625\,bd^2n-60\left(bd^2n+5\,ad^2\right)r^3+3125\,ad^2+325\left(bd^2n+5\,ad^2\right)r^2-750\left(bd^2n+5\,ad^2\right)r-\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/25*(4*(b*d^2*n + 5*a*d^2)*r^4 + 625*b*d^2*n - 60*(b*d^2*n + 5*a*d^2)*r^3
 + 3125*a*d^2 + 325*(b*d^2*n + 5*a*d^2)*r^2 - 750*(b*d^2*n + 5*a*d^2)*r - 2
5*(2*a*e^2*r^3 - 25*b*e^2*n - 125*a*e^2 - (b*e^2*n + 25*a*e^2)*r^2 + 10*(b*
e^2*n + 10*a*e^2)*r + (2*b*e^2*r^3 - 25*b*e^2*r^2 + 100*b*e^2*r - 125*b*e^2
)*log(c) + (2*b*e^2*n*r^3 - 25*b*e^2*n*r^2 + 100*b*e^2*n*r - 125*b*e^2*n)*l
og(x))*x^(2*r) - 50*(4*a*d*e*r^3 - 25*b*d*e*n - 125*a*d*e - 4*(b*d*e*n + 10
*a*d*e)*r^2 + 5*(4*b*d*e*n + 25*a*d*e)*r + (4*b*d*e*r^3 - 40*b*d*e*r^2 + 12
5*b*d*e*r - 125*b*d*e)*log(c) + (4*b*d*e*n*r^3 - 40*b*d*e*n*r^2 + 125*b*d*e
*n*r - 125*b*d*e*n)*log(x))*x^r + 5*(4*b*d^2*r^4 - 60*b*d^2*r^3 + 325*b*d^2
*r^2 - 750*b*d^2*r + 625*b*d^2)*log(c) + 5*(4*b*d^2*n*r^4 - 60*b*d^2*n*r^3
+ 325*b*d^2*n*r^2 - 750*b*d^2*n*r + 625*b*d^2*n)*log(x))/((4*r^4 - 60*r^3 +
 325*r^2 - 750*r + 625)*x^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r+d)^2\left(b\log\left(cx^n\right)+a\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^6, x)
```

maple [C] time = 0.32, size = 1930, normalized size = 15.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(b*ln(c*x^n)+a)/x^6,x)
```

```
[Out] -1/5*b*(-5*e^2*(x^r)^2*r+2*d^2*r^2-20*d*e*r*x^r+25*(x^r)^2*e^2-15*d^2*r+50*
d*e*x^r+25*d^2)/x^5/(-5+2*r)/(r-5)*ln(x^n)-1/50*(6250*I*Pi*b*d*e*r*x^r*csgn
(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+6250*ln(c)*b*e^2*(x^r)^2-100*a*e^2*r^3*(x^r
)^2+12500*a*d*e*x^r+1250*a*e^2*r^2*(x^r)^2-5000*a*e^2*r*(x^r)^2+1250*b*e^2*
n*(x^r)^2+40*b*d^2*r^4*ln(c)-600*b*d^2*r^3*ln(c)+3250*b*d^2*r^2*ln(c)-7500*
b*d^2*r*ln(c)+6250*a*d^2+8*b*d^2*n*r^4-120*b*d^2*n*r^3+1250*b*d^2*n+6250*a*
e^2*(x^r)^2+6250*b*d^2*ln(c)+40*a*d^2*r^4+650*b*d^2*n*r^2-1500*b*d^2*n*r+32
50*a*d^2*r^2-7500*a*d^2*r-600*a*d^2*r^3-625*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)*(x^r)^2-3125*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)-200*I*Pi*b*d*e*r^3*x^r*csgn(I*c)*csgn(I*c*x^n)^2+50*I*Pi*b*e^2*r^3*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+3750*I*Pi*b*d^2*r*csgn(I*c*x^n)^3+
50*b*e^2*n*r^2*(x^r)^2-400*a*d*e*r^3*x^r+625*I*Pi*b*e^2*r^2*csgn(I*x^n)*csg
n(I*c*x^n)^2*(x^r)^2-20*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-
3125*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-50*I*Pi*b*e^2*r
^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+6250*I*Pi*b*d*e*r*x^r*csgn(I*c*x^n)^3+
4000*a*d*e*r^2*x^r-12500*a*d*e*r*x^r-500*b*e^2*n*r*(x^r)^2+2500*b*d*e*n*x^r
+1250*ln(c)*b*e^2*r^2*(x^r)^2-5000*ln(c)*b*e^2*r*(x^r)^2+12500*b*d*e*x^r*ln
(c)-100*ln(c)*b*e^2*r^3*(x^r)^2-2000*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)*x^r-2000*b*d*e*n*r*x^r+400*b*d*e*n*r^2*x^r+4000*b*d*e*r^2*x^r*
ln(c)-12500*b*d*e*r*x^r*ln(c)-400*b*d*e*r^3*x^r*ln(c)+2000*I*Pi*b*d*e*r^2*c
sgn(I*c*x^n)^2*csgn(I*c)*x^r-6250*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*x^r+2000*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-3125*I*Pi*b*e
^2*csgn(I*c*x^n)^3*(x^r)^2+200*I*Pi*b*d*e*r^3*x^r*csgn(I*c)*csgn(I*x^n)*csg
n(I*c*x^n)+1625*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-50*I*Pi*b*e^2*r^
3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+200*I*Pi*b*d*e*r^3*x^r*csgn(I*c*x^n)^
3+2500*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-3125*I*Pi*b*d^2*csgn(I*c*x^n)^3
-6250*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r-625*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^
r)^2+3750*I*Pi*b*d^2*r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-6250*I*Pi*b*d*e*
r*x^r*csgn(I*x^n)*csgn(I*c*x^n)^2-2500*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^
n)^2*(x^r)^2-6250*I*Pi*b*d*e*r*x^r*csgn(I*c)*csgn(I*c*x^n)^2-300*I*Pi*b*d^2
*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2+50*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2+
300*I*Pi*b*d^2*r^3*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-2500*I*Pi*b*e^2*r*cs
gn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-200*I*Pi*b*d*e*r^3*x^r*csgn(I*x^n)*csgn(I*c
*x^n)^2-1625*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+3125*I*Pi*b*d^2*csgn(I*x^n)*csg
n(I*c*x^n)^2+3125*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+3125*I*Pi*b*e^2*csgn
(I*c*x^n)^2*csgn(I*c)*(x^r)^2-300*I*Pi*b*d^2*r^3*csgn(I*c)*csgn(I*c*x^n)^2+
6250*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+2500*I*Pi*b*e^2*r*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+300*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^3+1625*
I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)+20*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn
(I*c*x^n)^2+20*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)+3125*I*Pi*b*e^2*csg
n(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-20*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3-3750*I*P
i*b*d^2*r*csgn(I*c)*csgn(I*c*x^n)^2-3750*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*
x^n)^2+625*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-2000*I*Pi*b*d*e
*r^2*csgn(I*c*x^n)^3*x^r-1625*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)+6250*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r)/(-5+2*r)^2/x^5/(r-5)^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-6>0)', see `assume?` for more det
ails)Is r-6 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d + e\,x^r)^2\,\left(a + b\,\ln\left(c\,x^n\right)\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^6,x)
```

```
[Out] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^6, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] Timed out
```

3.391 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x^8}\,dx$

Optimal. Leaf size=127

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{7x^7}-\frac{2dex^{r-7}\left(a+b\log\left(cx^n\right)\right)}{7-r}-\frac{e^2x^{2r-7}\left(a+b\log\left(cx^n\right)\right)}{7-2r}-\frac{bd^2n}{49x^7}-\frac{2bdenx^{r-7}}{(7-r)^2}-\frac{be^2nx^{2r-7}}{(7-2r)^2}$$

```
[Out] -1/49*b*d^2*n/x^7-2*b*d*e*n*x^(-7+r)/(7-r)^2-b*e^2*n*x^(-7+2*r)/(7-2*r)^2-1
/7*d^2*(a+b*ln(c*x^n))/x^7-2*d*e*x^(-7+r)*(a+b*ln(c*x^n))/(7-r)-e^2*x^(-7+2
*r)*(a+b*ln(c*x^n))/(7-2*r)
```

Rubi [A] time = 0.18, antiderivative size = 109, normalized size of antiderivative = 0.86, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{7}\left(\frac{d^2}{x^7}+\frac{14dex^{r-7}}{7-r}+\frac{7e^2x^{2r-7}}{7-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{49x^7}-\frac{2bdenx^{r-7}}{(7-r)^2}-\frac{be^2nx^{2r-7}}{(7-2r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^2*n)/(49*x^7) - (2*b*d*e*n*x^(-7 + r))/(7 - r)^2 - (b*e^2*n*x^(-7 + 2
*r))/(7 - 2*r)^2 - ((d^2/x^7 + (14*d*e*x^(-7 + r))/(7 - r) + (7*e^2*x^(-7 +
 2*r))/(7 - 2*r))*(a + b*Log[c*x^n]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^2 \left(a+b\log\left(cx^n\right)\right)}{x^8}\,dx = -\frac{1}{7}\left(\frac{d^2}{x^7}+\frac{14dex^{-7+r}}{7-r}+\frac{7e^2x^{-7+2r}}{7-2r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-d^2+\frac{14dex^r}{-7+r}+}{7x^8}$$

$$= -\frac{1}{7}\left(\frac{d^2}{x^7}+\frac{14dex^{-7+r}}{7-r}+\frac{7e^2x^{-7+2r}}{7-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{7}(bn)\int \frac{-d^2+\frac{14dex^r}{-7+r}}{x^8}$$

$$= -\frac{1}{7}\left(\frac{d^2}{x^7}+\frac{14dex^{-7+r}}{7-r}+\frac{7e^2x^{-7+2r}}{7-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{7}(bn)\int\left(-\frac{d^2}{x^8}+\frac{14de}{-7}\right.$$

$$= -\frac{bd^2n}{49x^7}-\frac{2bdenx^{-7+r}}{(7-r)^2}-\frac{be^2nx^{-7+2r}}{(7-2r)^2}-\frac{1}{7}\left(\frac{d^2}{x^7}+\frac{14dex^{-7+r}}{7-r}+\frac{7e^2x^{-7+2r}}{7-2r}\right)(a+b$$

Mathematica [A] time = 0.30, size = 127, normalized size = 1.00

$$\frac{a\left(-7d^2+\frac{98dex^r}{r-7}+\frac{49e^2x^{2r}}{2r-7}\right)+7b\log\left(cx^n\right)\left(-d^2+\frac{14dex^r}{r-7}+\frac{7e^2x^{2r}}{2r-7}\right)+bn\left(-d^2-\frac{98dex^r}{(r-7)^2}-\frac{49e^2x^{2r}}{(7-2r)^2}\right)}{49x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] (b*n*(-d^2 - (98*d*e*x^r)/(-7 + r)^2 - (49*e^2*x^(2*r))/(7 - 2*r)^2) + a*(-
7*d^2 + (98*d*e*x^r)/(-7 + r) + (49*e^2*x^(2*r))/(-7 + 2*r)) + 7*b*(-d^2 +
(14*d*e*x^r)/(-7 + r) + (7*e^2*x^(2*r))/(-7 + 2*r))*Log[c*x^n])/(49*x^7)
```

fricas [B] time = 0.48, size = 466, normalized size = 3.67

$$-\frac{4\left(bd^2n+7\,ad^2\right)r^4+2401\,bd^2n-84\left(bd^2n+7\,ad^2\right)r^3+16807\,ad^2+637\left(bd^2n+7\,ad^2\right)r^2-2058\left(bd^2n+7\,ad^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")
```

```
[Out] -1/49*(4*(b*d^2*n + 7*a*d^2)*r^4 + 2401*b*d^2*n - 84*(b*d^2*n + 7*a*d^2)*r^
3 + 16807*a*d^2 + 637*(b*d^2*n + 7*a*d^2)*r^2 - 2058*(b*d^2*n + 7*a*d^2)*r
- 49*(2*a*e^2*r^3 - 49*b*e^2*n - 343*a*e^2 - (b*e^2*n + 35*a*e^2)*r^2 + 14*
(b*e^2*n + 14*a*e^2)*r + (2*b*e^2*r^3 - 35*b*e^2*r^2 + 196*b*e^2*r - 343*b*
e^2)*log(c) + (2*b*e^2*n*r^3 - 35*b*e^2*n*r^2 + 196*b*e^2*n*r - 343*b*e^2*n
)*log(x))*x^(2*r) - 98*(4*a*d*e*r^3 - 49*b*d*e*n - 343*a*d*e - 4*(b*d*e*n +
 14*a*d*e)*r^2 + 7*(4*b*d*e*n + 35*a*d*e)*r + (4*b*d*e*r^3 - 56*b*d*e*r^2 +
 245*b*d*e*r - 343*b*d*e)*log(c) + (4*b*d*e*n*r^3 - 56*b*d*e*n*r^2 + 245*b*
d*e*n*r - 343*b*d*e*n)*log(x))*x^r + 7*(4*b*d^2*r^4 - 84*b*d^2*r^3 + 637*b*
d^2*r^2 - 2058*b*d^2*r + 2401*b*d^2)*log(c) + 7*(4*b*d^2*n*r^4 - 84*b*d^2*n
*r^3 + 637*b*d^2*n*r^2 - 2058*b*d^2*n*r + 2401*b*d^2*n)*log(x))/((4*r^4 - 8
4*r^3 + 637*r^2 - 2058*r + 2401)*x^7)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r+d)^2\left(b\log\left(cx^n\right)+a\right)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^8,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^8, x)
```

maple [C] time = 0.34, size = 1930, normalized size = 15.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(b*ln(c*x^n)+a)/x^8,x)
```

```
[Out] -1/7*b*(-7*e^2*(x^r)^2*r+2*d^2*r^2-28*d*e*r*x^r+49*(x^r)^2*e^2-21*d^2*r+98*
d*e*x^r+49*d^2)/x^7/(-7+2*r)/(-7+r)*ln(x^n)-1/98*(33614*ln(c)*b*e^2*(x^r)^2
-196*a*e^2*r^3*(x^r)^2+67228*a*d*e*x^r+3430*a*e^2*r^2*(x^r)^2-19208*a*e^2*r
*(x^r)^2+4802*b*e^2*n*(x^r)^2+56*b*d^2*r^4*ln(c)-1176*b*d^2*r^3*ln(c)+8918*
b*d^2*r^2*ln(c)-28812*b*d^2*r*ln(c)+33614*a*d^2+8*b*d^2*n*r^4-168*b*d^2*n*r
^3+4802*b*d^2*n+33614*a*e^2*(x^r)^2+33614*b*d^2*ln(c)+56*a*d^2*r^4+1274*b*d
^2*n*r^2-4116*b*d^2*n*r+8918*a*d^2*r^2-28812*a*d^2*r-1176*a*d^2*r^3+392*I*P
i*b*d*e*r^3*csgn(I*c*x^n)^3*x^r-28*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-1715*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2+9604*I*Pi*b*e^2*r*cs
gn(I*c*x^n)^3*(x^r)^2-5488*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*x^r+24010*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-9604*I*Pi
*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+33614*I*Pi*b*d*e*csgn(I*x^n)*csg
n(I*c*x^n)^2*x^r+33614*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+28*I*Pi*b*d
^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)+392*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)*x^r+98*b*e^2*n*r^2*(x^r)^2-784*a*d*e*r^3*x^r+10976*a*d*e*r^2*x
^r-48020*a*d*e*r*x^r-1372*b*e^2*n*r*(x^r)^2+9604*b*d*e*n*x^r+3430*ln(c)*b*e
^2*r^2*(x^r)^2-19208*ln(c)*b*e^2*r*(x^r)^2+67228*b*d*e*x^r*ln(c)-196*ln(c)*
b*e^2*r^3*(x^r)^2-5488*b*d*e*n*r*x^r+784*b*d*e*n*r^2*x^r+10976*b*d*e*r^2*x^
r*ln(c)-48020*b*d*e*r*x^r*ln(c)-784*b*d*e*r^3*x^r*ln(c)-392*I*Pi*b*d*e*r^3*
csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-392*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c
)*x^r+98*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-1715*I*
Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+5488*I*Pi*b*d*e*r^
2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+14406*I*Pi*b*d^2*r*csgn(I*c*x^n)^3-588*I*Pi
*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)-588*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*
c*x^n)^2+98*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2+16807*I*Pi*b*e^2*csgn(I*
c*x^n)^2*csgn(I*c)*(x^r)^2+4459*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)-24
010*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-24010*I*Pi*b*d*e*r*csgn(I*
c*x^n)^2*csgn(I*c)*x^r+5488*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-
16807*I*Pi*b*d^2*csgn(I*c*x^n)^3-16807*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)+4459*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-14406*I*Pi*b*d^2
*r*csgn(I*c*x^n)^2*csgn(I*c)-14406*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2
-28*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3+28*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x
^n)^2-33614*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+9604*I*Pi*b*
e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-4459*I*Pi*b*d^2*r^2*csgn(
I*c*x^n)^3+16807*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+16807*I*Pi*b*d^2*cs
gn(I*c*x^n)^2*csgn(I*c)+588*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)+1715*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-5488*I*Pi*b*d*e*r
^2*csgn(I*c*x^n)^3*x^r-9604*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^
2+16807*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+14406*I*Pi*b*d^2*r*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4459*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)+1715*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-98*
I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-33614*I*Pi*b*d*e*csgn(I*
c*x^n)^3*x^r-16807*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2-98*I*Pi*b*e^2*r^3*csg
n(I*c*x^n)^2*csgn(I*c)*(x^r)^2+24010*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r-16807
*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+588*I*Pi*b*d^2*r^3*
csgn(I*c*x^n)^3)/(-7+2*r)^2/x^7/(-7+r)^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-8>0)', see `assume?` for more det
ails)Is r-8 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d + e\,x^r)^2\,\left(a + b\,\ln\left(c\,x^n\right)\right)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^8,x)
```

```
[Out] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x^8, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] Timed out
```

3.392 $\int x^5 (d + ex^r)^3 (a + b \log(cx^n)) \, dx$

Optimal. Leaf size=147

$$\frac{1}{6}\left(d^3x^6 + \frac{18d^2ex^{r+6}}{r+6} + \frac{9de^2x^{2(r+3)}}{r+3} + \frac{2e^3x^{3(r+2)}}{r+2}\right)(a + b\log(cx^n)) - \frac{1}{36}bd^3nx^6 - \frac{3bd^2enx^{r+6}}{(r+6)^2} - \frac{3bde^2nx^{2(r+3)}}{4(r+3)^2} - \frac{be}{9}$$

```
[Out] -1/36*b*d^3*n*x^6-1/9*b*e^3*n*x^(6+3*r)/(2+r)^2-3/4*b*d*e^2*n*x^(6+2*r)/(3+
r)^2-3*b*d^2*e*n*x^(6+r)/(6+r)^2+1/6*(d^3*x^6+2*e^3*x^(6+3*r)/(2+r)+9*d*e^2
*x^(6+2*r)/(3+r)+18*d^2*e*x^(6+r)/(6+r))*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.38, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{6}\left(\frac{18d^2ex^{r+6}}{r+6} + d^3x^6 + \frac{9de^2x^{2(r+3)}}{r+3} + \frac{2e^3x^{3(r+2)}}{r+2}\right)(a + b\log(cx^n)) - \frac{3bd^2enx^{r+6}}{(r+6)^2} - \frac{1}{36}bd^3nx^6 - \frac{3bde^2nx^{2(r+3)}}{4(r+3)^2} - \frac{be}{9}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^6)/36 - (b*e^3*n*x^(3*(2 + r)))/(9*(2 + r)^2) - (3*b*d*e^2*n*x^
(2*(3 + r)))/(4*(3 + r)^2) - (3*b*d^2*e*n*x^(6 + r))/(6 + r)^2 + ((d^3*x^6
+ (2*e^3*x^(3*(2 + r)))/(2 + r) + (9*d*e^2*x^(2*(3 + r)))/(3 + r) + (18*d^2
*e*x^(6 + r))/(6 + r))*(a + b*Log[c*x^n]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^5 (d+ex^r)^3 \left(a+b\log(cx^n)\right) dx = \frac{1}{6}\left(d^3x^6+\frac{2e^3x^{3(2+r)}}{2+r}+\frac{9de^2x^{2(3+r)}}{3+r}+\frac{18d^2ex^{6+r}}{6+r}\right)\left(a+b\log(cx^n)\right)-(bn)\int$$
$$=\frac{1}{6}\left(d^3x^6+\frac{2e^3x^{3(2+r)}}{2+r}+\frac{9de^2x^{2(3+r)}}{3+r}+\frac{18d^2ex^{6+r}}{6+r}\right)\left(a+b\log(cx^n)\right)-\frac{1}{6}(bn)$$
$$=\frac{1}{6}\left(d^3x^6+\frac{2e^3x^{3(2+r)}}{2+r}+\frac{9de^2x^{2(3+r)}}{3+r}+\frac{18d^2ex^{6+r}}{6+r}\right)\left(a+b\log(cx^n)\right)-\frac{1}{6}(bn)$$
$$=-\frac{1}{36}bd^3nx^6-\frac{be^3nx^{3(2+r)}}{9(2+r)^2}-\frac{3bde^2nx^{2(3+r)}}{4(3+r)^2}-\frac{3bd^2enx^{6+r}}{(6+r)^2}+\frac{1}{6}\left(d^3x^6+\frac{2e^3x}{2}\right.$$

Mathematica [A] time = 0.39, size = 172, normalized size = 1.17

$$\frac{1}{36}x^6\left(6a\left(d^3+\frac{18d^2ex^r}{r+6}+\frac{9de^2x^{2r}}{r+3}+\frac{2e^3x^{3r}}{r+2}\right)+6b\log(cx^n)\left(d^3+\frac{18d^2ex^r}{r+6}+\frac{9de^2x^{2r}}{r+3}+\frac{2e^3x^{3r}}{r+2}\right)+bn\left(-d^3-\frac{108}{(r\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^6*(b*n*(-d^3 - (108*d^2*e*x^r)/(6 + r)^2 - (27*d*e^2*x^(2*r))/(3 + r)^2
- (4*e^3*x^(3*r))/(2 + r)^2) + 6*a*(d^3 + (18*d^2*e*x^r)/(6 + r) + (9*d*e^2
*x^(2*r))/(3 + r) + (2*e^3*x^(3*r))/(2 + r)) + 6*b*(d^3 + (18*d^2*e*x^r)/(6
 + r) + (9*d*e^2*x^(2*r))/(3 + r) + (2*e^3*x^(3*r))/(2 + r))*Log[c*x^n]))/3
6
```

fricas [B] time = 0.51, size = 1011, normalized size = 6.88

$$\frac{6\left(bd^3r^6+22\,bd^3r^5+193\,bd^3r^4+864\,bd^3r^3+2088\,bd^3r^2+2592\,bd^3r+1296\,bd^3\right)x^6\log(c)+6\left(bd^3nr^6+22\,bd^3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/36*(6*(b*d^3*r^6 + 22*b*d^3*r^5 + 193*b*d^3*r^4 + 864*b*d^3*r^3 + 2088*b*
d^3*r^2 + 2592*b*d^3*r + 1296*b*d^3)*x^6*log(c) + 6*(b*d^3*n*r^6 + 22*b*d^3
*n*r^5 + 193*b*d^3*n*r^4 + 864*b*d^3*n*r^3 + 2088*b*d^3*n*r^2 + 2592*b*d^3*
n*r + 1296*b*d^3*n)*x^6*log(x) - ((b*d^3*n - 6*a*d^3)*r^6 + 22*(b*d^3*n - 6
*a*d^3)*r^5 + 1296*b*d^3*n + 193*(b*d^3*n - 6*a*d^3)*r^4 - 7776*a*d^3 + 864
*(b*d^3*n - 6*a*d^3)*r^3 + 2088*(b*d^3*n - 6*a*d^3)*r^2 + 2592*(b*d^3*n - 6
*a*d^3)*r)*x^6 + 4*(3*(b*e^3*r^5 + 20*b*e^3*r^4 + 153*b*e^3*r^3 + 558*b*e^3
*r^2 + 972*b*e^3*r + 648*b*e^3)*x^6*log(c) + 3*(b*e^3*n*r^5 + 20*b*e^3*n*r^
4 + 153*b*e^3*n*r^3 + 558*b*e^3*n*r^2 + 972*b*e^3*n*r + 648*b*e^3*n)*x^6*lo
g(x) + (3*a*e^3*r^5 - 324*b*e^3*n - (b*e^3*n - 60*a*e^3)*r^4 + 1944*a*e^3 -
 9*(2*b*e^3*n - 51*a*e^3)*r^3 - 9*(13*b*e^3*n - 186*a*e^3)*r^2 - 324*(b*e^3
*n - 9*a*e^3)*r)*x^6)*x^(3*r) + 27*(2*(b*d*e^2*r^5 + 19*b*d*e^2*r^4 + 136*b
*d*e^2*r^3 + 456*b*d*e^2*r^2 + 720*b*d*e^2*r + 432*b*d*e^2)*x^6*log(c) + 2*
(b*d*e^2*n*r^5 + 19*b*d*e^2*n*r^4 + 136*b*d*e^2*n*r^3 + 456*b*d*e^2*n*r^2 +
 720*b*d*e^2*n*r + 432*b*d*e^2*n)*x^6*log(x) + (2*a*d*e^2*r^5 - 144*b*d*e^2
*n - (b*d*e^2*n - 38*a*d*e^2)*r^4 + 864*a*d*e^2 - 16*(b*d*e^2*n - 17*a*d*e^
2)*r^3 - 8*(11*b*d*e^2*n - 114*a*d*e^2)*r^2 - 96*(2*b*d*e^2*n - 15*a*d*e^2)
*r)*x^6)*x^(2*r) + 108*((b*d^2*e*r^5 + 16*b*d^2*e*r^4 + 97*b*d^2*e*r^3 + 28
2*b*d^2*e*r^2 + 396*b*d^2*e*r + 216*b*d^2*e)*x^6*log(c) + (b*d^2*e*n*r^5 +
16*b*d^2*e*n*r^4 + 97*b*d^2*e*n*r^3 + 282*b*d^2*e*n*r^2 + 396*b*d^2*e*n*r +
 216*b*d^2*e*n)*x^6*log(x) + (a*d^2*e*r^5 - 36*b*d^2*e*n - (b*d^2*e*n - 16*
a*d^2*e)*r^4 + 216*a*d^2*e - (10*b*d^2*e*n - 97*a*d^2*e)*r^3 - (37*b*d^2*e*
```

```
n - 282*a*d^2*e)*r^2 - 12*(5*b*d^2*e*n - 33*a*d^2*e)*r)*x^6)*x^r)/(r^6 + 22
*r^5 + 193*r^4 + 864*r^3 + 2088*r^2 + 2592*r + 1296)
```

giac [B] time = 0.57, size = 1586, normalized size = 10.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/36*(6*b*d^3*n*r^6*x^6*log(x) + 108*b*d^2*n*r^5*x^6*x^r*e*log(x) - b*d^3*n
*r^6*x^6 + 6*b*d^3*r^6*x^6*log(c) + 108*b*d^2*r^5*x^6*x^r*e*log(c) + 132*b*
d^3*n*r^5*x^6*log(x) + 54*b*d*n*r^5*x^6*x^(2*r)*e^2*log(x) + 1728*b*d^2*n*r
^4*x^6*x^r*e*log(x) - 22*b*d^3*n*r^5*x^6 + 6*a*d^3*r^6*x^6 - 108*b*d^2*n*r^
4*x^6*x^r*e + 108*a*d^2*r^5*x^6*x^r*e + 132*b*d^3*r^5*x^6*log(c) + 54*b*d*r
^5*x^6*x^(2*r)*e^2*log(c) + 1728*b*d^2*r^4*x^6*x^r*e*log(c) + 1158*b*d^3*n*
r^4*x^6*log(x) + 12*b*n*r^5*x^6*x^(3*r)*e^3*log(x) + 1026*b*d*n*r^4*x^6*x^(
2*r)*e^2*log(x) + 10476*b*d^2*n*r^3*x^6*x^r*e*log(x) - 193*b*d^3*n*r^4*x^6
+ 132*a*d^3*r^5*x^6 - 27*b*d*n*r^4*x^6*x^(2*r)*e^2 + 54*a*d*r^5*x^6*x^(2*r)
*e^2 - 1080*b*d^2*n*r^3*x^6*x^r*e + 1728*a*d^2*r^4*x^6*x^r*e + 1158*b*d^3*r
^4*x^6*log(c) + 12*b*r^5*x^6*x^(3*r)*e^3*log(c) + 1026*b*d*r^4*x^6*x^(2*r)*
e^2*log(c) + 10476*b*d^2*r^3*x^6*x^r*e*log(c) + 5184*b*d^3*n*r^3*x^6*log(x)
 + 240*b*n*r^4*x^6*x^(3*r)*e^3*log(x) + 7344*b*d*n*r^3*x^6*x^(2*r)*e^2*log(
x) + 30456*b*d^2*n*r^2*x^6*x^r*e*log(x) - 864*b*d^3*n*r^3*x^6 + 1158*a*d^3*
r^4*x^6 - 4*b*n*r^4*x^6*x^(3*r)*e^3 + 12*a*r^5*x^6*x^(3*r)*e^3 - 432*b*d*n*
r^3*x^6*x^(2*r)*e^2 + 1026*a*d*r^4*x^6*x^(2*r)*e^2 - 3996*b*d^2*n*r^2*x^6*x
^r*e + 10476*a*d^2*r^3*x^6*x^r*e + 5184*b*d^3*r^3*x^6*log(c) + 240*b*r^4*x^
6*x^(3*r)*e^3*log(c) + 7344*b*d*r^3*x^6*x^(2*r)*e^2*log(c) + 30456*b*d^2*r^
2*x^6*x^r*e*log(c) + 12528*b*d^3*n*r^2*x^6*log(x) + 1836*b*n*r^3*x^6*x^(3*r
)*e^3*log(x) + 24624*b*d*n*r^2*x^6*x^(2*r)*e^2*log(x) + 42768*b*d^2*n*r*x^6
*x^r*e*log(x) - 2088*b*d^3*n*r^2*x^6 + 5184*a*d^3*r^3*x^6 - 72*b*n*r^3*x^6*
x^(3*r)*e^3 + 240*a*r^4*x^6*x^(3*r)*e^3 - 2376*b*d*n*r^2*x^6*x^(2*r)*e^2 +
7344*a*d*r^3*x^6*x^(2*r)*e^2 - 6480*b*d^2*n*r*x^6*x^r*e + 30456*a*d^2*r^2*x
^6*x^r*e + 12528*b*d^3*r^2*x^6*log(c) + 1836*b*r^3*x^6*x^(3*r)*e^3*log(c) +
 24624*b*d*r^2*x^6*x^(2*r)*e^2*log(c) + 42768*b*d^2*r*x^6*x^r*e*log(c) + 15
552*b*d^3*n*r*x^6*log(x) + 6696*b*n*r^2*x^6*x^(3*r)*e^3*log(x) + 38880*b*d*
n*r*x^6*x^(2*r)*e^2*log(x) + 23328*b*d^2*n*x^6*x^r*e*log(x) - 2592*b*d^3*n*
r*x^6 + 12528*a*d^3*r^2*x^6 - 468*b*n*r^2*x^6*x^(3*r)*e^3 + 1836*a*r^3*x^6*
x^(3*r)*e^3 - 5184*b*d*n*r*x^6*x^(2*r)*e^2 + 24624*a*d*r^2*x^6*x^(2*r)*e^2
- 3888*b*d^2*n*x^6*x^r*e + 42768*a*d^2*r*x^6*x^r*e + 15552*b*d^3*r*x^6*log(
c) + 6696*b*r^2*x^6*x^(3*r)*e^3*log(c) + 38880*b*d*r*x^6*x^(2*r)*e^2*log(c)
 + 23328*b*d^2*x^6*x^r*e*log(c) + 7776*b*d^3*n*x^6*log(x) + 11664*b*n*r*x^6
*x^(3*r)*e^3*log(x) + 23328*b*d*n*x^6*x^(2*r)*e^2*log(x) - 1296*b*d^3*n*x^6
 + 15552*a*d^3*r*x^6 - 1296*b*n*r*x^6*x^(3*r)*e^3 + 6696*a*r^2*x^6*x^(3*r)*
e^3 - 3888*b*d*n*x^6*x^(2*r)*e^2 + 38880*a*d*r*x^6*x^(2*r)*e^2 + 23328*a*d^
2*x^6*x^r*e + 7776*b*d^3*x^6*log(c) + 11664*b*r*x^6*x^(3*r)*e^3*log(c) + 23
328*b*d*x^6*x^(2*r)*e^2*log(c) + 7776*b*n*x^6*x^(3*r)*e^3*log(x) + 7776*a*d
^3*x^6 - 1296*b*n*x^6*x^(3*r)*e^3 + 11664*a*r*x^6*x^(3*r)*e^3 + 23328*a*d*x
^6*x^(2*r)*e^2 + 7776*b*x^6*x^(3*r)*e^3*log(c) + 7776*a*x^6*x^(3*r)*e^3)/(r
^6 + 22*r^5 + 193*r^4 + 864*r^3 + 2088*r^2 + 2592*r + 1296)
```

maple [C] time = 0.49, size = 4021, normalized size = 27.35

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d+e*x^r)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/6*x^6*b*(2*e^3*r^2*(x^r)^3+9*d*e^2*r^2*(x^r)^2+18*e^3*r*(x^r)^3+d^3*r^3+1
8*d^2*e*r^2*x^r+72*d*e^2*r*(x^r)^2+36*e^3*(x^r)^3+11*d^3*r^2+90*d^2*e*r*x^r
```

+108*d*e^2*(x^r)^2+36*d^3*r+108*d^2*e*x^r+36*d^3)/(r+2)/(r+3)/(r+6)*ln(x^n)
-1/36*x^6*(-132*a*d^3*r^5-1158*a*d^3*r^4-5832*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*
csgn(I*c)*(x^r)^3+b*d^3*n*r^6+22*b*d^3*n*r^5+193*b*d^3*n*r^4-7776*a*e^3*(x^
r)^3-7776*a*d^3-6*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-6*ln(c
)*b*d^3*r^6-132*ln(c)*b*d^3*r^5-1158*ln(c)*b*d^3*r^4-5184*ln(c)*b*d^3*r^3-1
2528*ln(c)*b*d^3*r^2-15552*ln(c)*b*d^3*r-6*a*d^3*r^6+1296*b*d^3*n-12*a*e^3*
r^5*(x^r)^3-240*a*e^3*r^4*(x^r)^3-7776*ln(c)*b*e^3*(x^r)^3+1296*b*e^3*n*(x^
r)^3-1836*a*e^3*r^3*(x^r)^3-6696*a*e^3*r^2*(x^r)^3-11664*a*e^3*r*(x^r)^3-23
328*a*d*e^2*(x^r)^2-23328*a*d^2*e*x^r-7776*b*d^3*ln(c)+864*b*d^3*n*r^3+2088
*b*d^3*n*r^2+2592*b*d^3*n*r+864*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*x^r-5184*a*d^3*r^3-12528*a*d^3*r^2-15552*a*d^3*r+2592*I*Pi*b*d^3*
r^3*csgn(I*c*x^n)^3-38880*ln(c)*b*d*e^2*r*(x^r)^2-10476*ln(c)*b*d^2*e*r^3*x
^r-30456*ln(c)*b*d^2*e*r^2*x^r-42768*ln(c)*b*d^2*e*r*x^r-7344*ln(c)*b*d*e^2
r^3(x^r)^2-24624*ln(c)*b*d*e^2*r^2*(x^r)^2+6480*b*d^2*e*n*r*x^r+2376*b*d*
e^2*n*r^2*(x^r)^2+3996*b*d^2*e*n*r^2*x^r+5238*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n
)^3*x^r-12312*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+918*I*Pi*b
*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-3672*I*Pi*b*d*e^2*r^3*
csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-3672*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*c
sgn(I*c)*(x^r)^2+3348*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x
^r)^3-5238*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-5238*I*Pi*b*d^2
*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+12312*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*(x^r)^2+11664*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-388
8*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+5832*I*Pi*b*e^3*r*csgn(I*c
x^n)^3(x^r)^3+3348*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3-3348*I*Pi*b*e^3
*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+864*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)
^3*x^r+21384*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r-11664*I*Pi*b*d*e^2*csgn(I*x
^n)*csgn(I*c*x^n)^2*(x^r)^2-11664*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x
^r)^2-7776*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2-7776*I*Pi*b*d^3*r*csgn(
I*c*x^n)^2*csgn(I*c)+3888*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+38
88*b*d^2*e*n*x^r-7344*a*d*e^2*r^3*(x^r)^2-24624*a*d*e^2*r^2*(x^r)^2-38880*a
*d*e^2*r*(x^r)^2-10476*a*d^2*e*r^3*x^r-30456*a*d^2*e*r^2*x^r+5832*I*Pi*b*e^
3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-15228*I*Pi*b*d^2*e*r^2*csgn
(I*x^n)*csgn(I*c*x^n)^2*x^r+120*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*(x^r)^3-54*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+6*I*Pi*
b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3+120*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^
3-5832*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+15228*I*Pi*b*d^2*e*
r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+19440*I*Pi*b*d*e^2*r*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+12312*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x
^r)^2-66*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)-579*I*Pi*b*d^3*r^4*csgn(I
*x^n)*csgn(I*c*x^n)^2-579*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b
*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2+72*b*e^3*n*r^3*(x^r)^3-54*a*d*e^2*r^5*
(x^r)^2-1026*a*d*e^2*r^4*(x^r)^2-108*a*d^2*e*r^5*x^r-1728*a*d^2*e*r^4*x^r+4
68*b*e^3*n*r^2*(x^r)^3+1296*b*e^3*n*r*(x^r)^3+3888*b*d*e^2*n*(x^r)^2+3888*I
*Pi*b*d^3*csgn(I*c*x^n)^3+4*b*e^3*n*r^4*(x^r)^3-42768*a*d^2*e*r*x^r-23328*l
n(c)*b*d^2*e*x^r-23328*ln(c)*b*d*e^2*(x^r)^2-12*ln(c)*b*e^3*r^5*(x^r)^3-240
*ln(c)*b*e^3*r^4*(x^r)^3-1836*ln(c)*b*e^3*r^3*(x^r)^3-6696*ln(c)*b*e^3*r^2*
(x^r)^3-11664*ln(c)*b*e^3*r*(x^r)^3+66*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)+579*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+7776*
I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+15228*I*Pi*b*d^2*e*r^2*csg
n(I*c*x^n)^3*x^r-3*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-66*I*Pi*b*d^3*r
^5*csgn(I*x^n)*csgn(I*c*x^n)^2-3888*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x
^r)^3+6*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-19440*I*
Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-21384*I*Pi*b*d^2*e*r*csgn(I*
x^n)*csgn(I*c*x^n)^2*x^r-19440*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(
x^r)^2-27*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-918*I*Pi*b*e
^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+27*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n
)^3*(x^r)^2-918*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-27*I*Pi*b*
d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-12312*I*Pi*b*d*e^2*r^2*csgn(I*x
^n)*csgn(I*c*x^n)^2*(x^r)^2+6264*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3+7776*I*Pi*b

```
*d^3*r*csgn(I*c*x^n)^3-3888*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-3888*I*P
i*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+3*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+5184*b*d
*e^2*n*r*(x^r)^2-54*ln(c)*b*d*e^2*r^5*(x^r)^2-1026*ln(c)*b*d*e^2*r^4*(x^r)^
2-108*ln(c)*b*d^2*e*r^5*x^r-1728*ln(c)*b*d^2*e*r^4*x^r+27*b*d*e^2*n*r^4*(x^
r)^2+432*b*d*e^2*n*r^3*(x^r)^2+108*b*d^2*e*n*r^4*x^r+1080*b*d^2*e*n*r^3*x^r
-864*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-864*I*Pi*b*d^2*e*r^4*
csgn(I*c*x^n)^2*csgn(I*c)*x^r+918*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+11
664*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r-54*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*cs
gn(I*c)*x^r-513*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-513*I*
Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+3888*I*Pi*b*e^3*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-3348*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(
I*c)*(x^r)^3+3672*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r
)^2-120*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-120*I*Pi*b*e^3*r
^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+54*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^
r+6264*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+513*I*Pi*b*d*e^2*
r^4*csgn(I*c*x^n)^3*(x^r)^2-15228*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c
)*x^r-21384*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+11664*I*Pi*b*d*e^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+11664*I*Pi*b*d^2*e*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*x^r+27*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*(x^r)^2+54*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x
^r+513*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+66*I*Pi
*b*d^3*r^5*csgn(I*c*x^n)^3+579*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3+3888*I*Pi*b*e
^3*csgn(I*c*x^n)^3*(x^r)^3+3672*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2+21
384*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-6*I*Pi*b*e^3*r^5
*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+19440*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^
r)^2+5238*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2592*I*P
i*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-11664*I*Pi*b*d^2*e*csgn(I*x
^n)*csgn(I*c*x^n)^2*x^r-11664*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+3*
I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-6264*I*Pi*b*d^3*r^2*csgn
(I*x^n)*csgn(I*c*x^n)^2-6264*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)-2592*
I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-2592*I*Pi*b*d^3*r^3*csgn(I*c*x^n
)^2*csgn(I*c))/(r+2)^2/(r+3)^2/(r+6)^2
```

maxima [A] time = 1.03, size = 218, normalized size = 1.48

$$-\frac{1}{36}\,bd^3nx^6+\frac{1}{6}\,bd^3x^6\log\left(cx^n\right)+\frac{1}{6}\,ad^3x^6+\frac{be^3x^{3\,r+6}\log\left(cx^n\right)}{3\,(r+2)}+\frac{3\,bde^2x^{2\,r+6}\log\left(cx^n\right)}{2\,(r+3)}+\frac{3\,bd^2ex^{r+6}\log\left(cx^n\right)}{r+6}-\frac{be^3}{9(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/36*b*d^3*n*x^6 + 1/6*b*d^3*x^6*log(c*x^n) + 1/6*a*d^3*x^6 + 1/3*b*e^3*x^
(3*r + 6)*log(c*x^n)/(r + 2) + 3/2*b*d*e^2*x^(2*r + 6)*log(c*x^n)/(r + 3) +
 3*b*d^2*e*x^(r + 6)*log(c*x^n)/(r + 6) - 1/9*b*e^3*n*x^(3*r + 6)/(r + 2)^2
 + 1/3*a*e^3*x^(3*r + 6)/(r + 2) - 3/4*b*d*e^2*n*x^(2*r + 6)/(r + 3)^2 + 3/
2*a*d*e^2*x^(2*r + 6)/(r + 3) - 3*b*d^2*e*n*x^(r + 6)/(r + 6)^2 + 3*a*d^2*e
*x^(r + 6)/(r + 6)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^5\,{\left(d+e\,x^r\right)}^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d + e*x^r)^3*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^5*(d + e*x^r)^3*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.393 $\int x^3 (d+ex^r)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=149

$$\frac{1}{4}\left(d^3x^4+\frac{12d^2ex^{r+4}}{r+4}+\frac{6de^2x^{2(r+2)}}{r+2}+\frac{4e^3x^{3r+4}}{3r+4}\right)\left(a+b\log(cx^n)\right)-\frac{1}{16}bd^3nx^4-\frac{3bd^2enx^{r+4}}{(r+4)^2}-\frac{3bde^2nx^{2(r+2)}}{4(r+2)^2}-\frac{be^3 n}{(3r}$$

```
[Out] -1/16*b*d^3*n*x^4-3/4*b*d*e^2*n*x^(4+2*r)/(2+r)^2-3*b*d^2*e*n*x^(4+r)/(4+r)
^2-b*e^3*n*x^(4+3*r)/(4+3*r)^2+1/4*(d^3*x^4+6*d*e^2*x^(4+2*r)/(2+r)+12*d^2*
e*x^(4+r)/(4+r)+4*e^3*x^(4+3*r)/(4+3*r))*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.39, antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{4}\left(\frac{12d^2ex^{r+4}}{r+4}+d^3x^4+\frac{6de^2x^{2(r+2)}}{r+2}+\frac{4e^3x^{3r+4}}{3r+4}\right)\left(a+b\log(cx^n)\right)-\frac{3bd^2enx^{r+4}}{(r+4)^2}-\frac{1}{16}bd^3nx^4-\frac{3bde^2nx^{2(r+2)}}{4(r+2)^2}-\frac{be^3 n}{(3r}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^4)/16 - (3*b*d*e^2*n*x^(2*(2 + r)))/(4*(2 + r)^2) - (3*b*d^2*e*
n*x^(4 + r))/(4 + r)^2 - (b*e^3*n*x^(4 + 3*r))/(4 + 3*r)^2 + ((d^3*x^4 + (6
*d*e^2*x^(2*(2 + r)))/(2 + r) + (12*d^2*e*x^(4 + r))/(4 + r) + (4*e^3*x^(4
+ 3*r))/(4 + 3*r))*(a + b*Log[c*x^n]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^3 (d+ex^r)^3 (a+b\log(cx^n))\,dx = \frac{1}{4}\left(d^3x^4+\frac{6de^2x^{2(2+r)}}{2+r}+\frac{12d^2ex^{4+r}}{4+r}+\frac{4e^3x^{4+3r}}{4+3r}\right)(a+b\log(cx^n))-(bn)\int$$
$$=\frac{1}{4}\left(d^3x^4+\frac{6de^2x^{2(2+r)}}{2+r}+\frac{12d^2ex^{4+r}}{4+r}+\frac{4e^3x^{4+3r}}{4+3r}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)$$
$$=\frac{1}{4}\left(d^3x^4+\frac{6de^2x^{2(2+r)}}{2+r}+\frac{12d^2ex^{4+r}}{4+r}+\frac{4e^3x^{4+3r}}{4+3r}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)$$
$$=-\frac{1}{16}bd^3nx^4-\frac{3bde^2nx^{2(2+r)}}{4(2+r)^2}-\frac{3bd^2enx^{4+r}}{(4+r)^2}-\frac{be^3nx^{4+3r}}{(4+3r)^2}+\frac{1}{4}\left(d^3x^4+\frac{6de^2x}{2+}\right.$$

Mathematica [**A**] time = 0.36, size = 178, normalized size = 1.19

$$\frac{1}{16}x^4\left(4a\left(d^3+\frac{12d^2ex^r}{r+4}+\frac{6de^2x^{2r}}{r+2}+\frac{4e^3x^{3r}}{3r+4}\right)+4b\log(cx^n)\left(d^3+\frac{12d^2ex^r}{r+4}+\frac{6de^2x^{2r}}{r+2}+\frac{4e^3x^{3r}}{3r+4}\right)+bn\left(-d^3-\frac{48d}{(r+}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(b*n*(-d^3 - (48*d^2*e*x^r)/(4 + r)^2 - (12*d*e^2*x^(2*r))/(2 + r)^2 -
 (16*e^3*x^(3*r))/(4 + 3*r)^2) + 4*a*(d^3 + (12*d^2*e*x^r)/(4 + r) + (6*d*e
^2*x^(2*r))/(2 + r) + (4*e^3*x^(3*r))/(4 + 3*r)) + 4*b*(d^3 + (12*d^2*e*x^r
)/(4 + r) + (6*d*e^2*x^(2*r))/(2 + r) + (4*e^3*x^(3*r))/(4 + 3*r))*Log[c*x^
n]))/16
```

fricas [**B**] time = 0.51, size = 1022, normalized size = 6.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/16*(4*(9*b*d^3*r^6 + 132*b*d^3*r^5 + 772*b*d^3*r^4 + 2304*b*d^3*r^3 + 371
2*b*d^3*r^2 + 3072*b*d^3*r + 1024*b*d^3)*x^4*log(c) + 4*(9*b*d^3*n*r^6 + 13
2*b*d^3*n*r^5 + 772*b*d^3*n*r^4 + 2304*b*d^3*n*r^3 + 3712*b*d^3*n*r^2 + 307
2*b*d^3*n*r + 1024*b*d^3*n)*x^4*log(x) - (9*(b*d^3*n - 4*a*d^3)*r^6 + 132*(
b*d^3*n - 4*a*d^3)*r^5 + 1024*b*d^3*n + 772*(b*d^3*n - 4*a*d^3)*r^4 - 4096*
a*d^3 + 2304*(b*d^3*n - 4*a*d^3)*r^3 + 3712*(b*d^3*n - 4*a*d^3)*r^2 + 3072*
(b*d^3*n - 4*a*d^3)*r)*x^4 + 16*((3*b*e^3*r^5 + 40*b*e^3*r^4 + 204*b*e^3*r^
3 + 496*b*e^3*r^2 + 576*b*e^3*r + 256*b*e^3)*x^4*log(c) + (3*b*e^3*n*r^5 +
40*b*e^3*n*r^4 + 204*b*e^3*n*r^3 + 496*b*e^3*n*r^2 + 576*b*e^3*n*r + 256*b*
e^3*n)*x^4*log(x) + (3*a*e^3*r^5 - 64*b*e^3*n - (b*e^3*n - 40*a*e^3)*r^4 +
256*a*e^3 - 12*(b*e^3*n - 17*a*e^3)*r^3 - 4*(13*b*e^3*n - 124*a*e^3)*r^2 -
96*(b*e^3*n - 6*a*e^3)*r)*x^4)*x^(3*r) + 12*(2*(9*b*d*e^2*r^5 + 114*b*d*e^2
*r^4 + 544*b*d*e^2*r^3 + 1216*b*d*e^2*r^2 + 1280*b*d*e^2*r + 512*b*d*e^2)*x
^4*log(c) + 2*(9*b*d*e^2*n*r^5 + 114*b*d*e^2*n*r^4 + 544*b*d*e^2*n*r^3 + 12
16*b*d*e^2*n*r^2 + 1280*b*d*e^2*n*r + 512*b*d*e^2*n)*x^4*log(x) + (18*a*d*e
^2*r^5 - 256*b*d*e^2*n - 3*(3*b*d*e^2*n - 76*a*d*e^2)*r^4 + 1024*a*d*e^2 -
32*(3*b*d*e^2*n - 34*a*d*e^2)*r^3 - 32*(11*b*d*e^2*n - 76*a*d*e^2)*r^2 - 51
2*(b*d*e^2*n - 5*a*d*e^2)*r)*x^4)*x^(2*r) + 48*((9*b*d^2*e*r^5 + 96*b*d^2*e
*r^4 + 388*b*d^2*e*r^3 + 752*b*d^2*e*r^2 + 704*b*d^2*e*r + 256*b*d^2*e)*x^4
*log(c) + (9*b*d^2*e*n*r^5 + 96*b*d^2*e*n*r^4 + 388*b*d^2*e*n*r^3 + 752*b*d
^2*e*n*r^2 + 704*b*d^2*e*n*r + 256*b*d^2*e*n)*x^4*log(x) + (9*a*d^2*e*r^5 -
 64*b*d^2*e*n - 3*(3*b*d^2*e*n - 32*a*d^2*e)*r^4 + 256*a*d^2*e - 4*(15*b*d^
2*e*n - 97*a*d^2*e)*r^3 - 4*(37*b*d^2*e*n - 188*a*d^2*e)*r^2 - 32*(5*b*d^2*
e*n - 22*a*d^2*e)*r)*x^4)*x^r)/(9*r^6 + 132*r^5 + 772*r^4 + 2304*r^3 + 3712
*r^2 + 3072*r + 1024)
```

giac [B] time = 0.49, size = 1588, normalized size = 10.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/16*(36*b*d^3*n*r^6*x^4*log(x) + 432*b*d^2*n*r^5*x^4*x^r*e*log(x) - 9*b*d^
3*n*r^6*x^4 + 36*b*d^3*r^6*x^4*log(c) + 432*b*d^2*r^5*x^4*x^r*e*log(c) + 52
8*b*d^3*n*r^5*x^4*log(x) + 216*b*d*n*r^5*x^4*x^(2*r)*e^2*log(x) + 4608*b*d^
2*n*r^4*x^4*x^r*e*log(x) - 132*b*d^3*n*r^5*x^4 + 36*a*d^3*r^6*x^4 - 432*b*d
^2*n*r^4*x^4*x^r*e + 432*a*d^2*r^5*x^4*x^r*e + 528*b*d^3*r^5*x^4*log(c) + 2
16*b*d*r^5*x^4*x^(2*r)*e^2*log(c) + 4608*b*d^2*r^4*x^4*x^r*e*log(c) + 3088*
b*d^3*n*r^4*x^4*log(x) + 48*b*n*r^5*x^4*x^(3*r)*e^3*log(x) + 2736*b*d*n*r^4
*x^4*x^(2*r)*e^2*log(x) + 18624*b*d^2*n*r^3*x^4*x^r*e*log(x) - 772*b*d^3*n*
r^4*x^4 + 528*a*d^3*r^5*x^4 - 108*b*d*n*r^4*x^4*x^(2*r)*e^2 + 216*a*d*r^5*x
^4*x^(2*r)*e^2 - 2880*b*d^2*n*r^3*x^4*x^r*e + 4608*a*d^2*r^4*x^4*x^r*e + 30
88*b*d^3*r^4*x^4*log(c) + 48*b*r^5*x^4*x^(3*r)*e^3*log(c) + 2736*b*d*r^4*x^
4*x^(2*r)*e^2*log(c) + 18624*b*d^2*r^3*x^4*x^r*e*log(c) + 9216*b*d^3*n*r^3*
x^4*log(x) + 640*b*n*r^4*x^4*x^(3*r)*e^3*log(x) + 13056*b*d*n*r^3*x^4*x^(2*
r)*e^2*log(x) + 36096*b*d^2*n*r^2*x^4*x^r*e*log(x) - 2304*b*d^3*n*r^3*x^4 +
 3088*a*d^3*r^4*x^4 - 16*b*n*r^4*x^4*x^(3*r)*e^3 + 48*a*r^5*x^4*x^(3*r)*e^3
 - 1152*b*d*n*r^3*x^4*x^(2*r)*e^2 + 2736*a*d*r^4*x^4*x^(2*r)*e^2 - 7104*b*d
^2*n*r^2*x^4*x^r*e + 18624*a*d^2*r^3*x^4*x^r*e + 9216*b*d^3*r^3*x^4*log(c)
+ 640*b*r^4*x^4*x^(3*r)*e^3*log(c) + 13056*b*d*r^3*x^4*x^(2*r)*e^2*log(c) +
 36096*b*d^2*r^2*x^4*x^r*e*log(c) + 14848*b*d^3*n*r^2*x^4*log(x) + 3264*b*n
*r^3*x^4*x^(3*r)*e^3*log(x) + 29184*b*d*n*r^2*x^4*x^(2*r)*e^2*log(x) + 3379
2*b*d^2*n*r*x^4*x^r*e*log(x) - 3712*b*d^3*n*r^2*x^4 + 9216*a*d^3*r^3*x^4 -
192*b*n*r^3*x^4*x^(3*r)*e^3 + 640*a*r^4*x^4*x^(3*r)*e^3 - 4224*b*d*n*r^2*x^
4*x^(2*r)*e^2 + 13056*a*d*r^3*x^4*x^(2*r)*e^2 - 7680*b*d^2*n*r*x^4*x^r*e +
36096*a*d^2*r^2*x^4*x^r*e + 14848*b*d^3*r^2*x^4*log(c) + 3264*b*r^3*x^4*x^(
3*r)*e^3*log(c) + 29184*b*d*r^2*x^4*x^(2*r)*e^2*log(c) + 33792*b*d^2*r*x^4*
x^r*e*log(c) + 12288*b*d^3*n*r*x^4*log(x) + 7936*b*n*r^2*x^4*x^(3*r)*e^3*lo
g(x) + 30720*b*d*n*r*x^4*x^(2*r)*e^2*log(x) + 12288*b*d^2*n*x^4*x^r*e*log(x
) - 3072*b*d^3*n*r*x^4 + 14848*a*d^3*r^2*x^4 - 832*b*n*r^2*x^4*x^(3*r)*e^3
+ 3264*a*r^3*x^4*x^(3*r)*e^3 - 6144*b*d*n*r*x^4*x^(2*r)*e^2 + 29184*a*d*r^2
*x^4*x^(2*r)*e^2 - 3072*b*d^2*n*x^4*x^r*e + 33792*a*d^2*r*x^4*x^r*e + 12288
*b*d^3*r*x^4*log(c) + 7936*b*r^2*x^4*x^(3*r)*e^3*log(c) + 30720*b*d*r*x^4*x
^(2*r)*e^2*log(c) + 12288*b*d^2*x^4*x^r*e*log(c) + 4096*b*d^3*n*x^4*log(x)
+ 9216*b*n*r*x^4*x^(3*r)*e^3*log(x) + 12288*b*d*n*x^4*x^(2*r)*e^2*log(x) -
1024*b*d^3*n*x^4 + 12288*a*d^3*r*x^4 - 1536*b*n*r*x^4*x^(3*r)*e^3 + 7936*a*
r^2*x^4*x^(3*r)*e^3 - 3072*b*d*n*x^4*x^(2*r)*e^2 + 30720*a*d*r*x^4*x^(2*r)*
e^2 + 12288*a*d^2*x^4*x^r*e + 4096*b*d^3*x^4*log(c) + 9216*b*r*x^4*x^(3*r)*
e^3*log(c) + 12288*b*d*x^4*x^(2*r)*e^2*log(c) + 4096*b*n*x^4*x^(3*r)*e^3*lo
g(x) + 4096*a*d^3*x^4 - 1024*b*n*x^4*x^(3*r)*e^3 + 9216*a*r*x^4*x^(3*r)*e^3
 + 12288*a*d*x^4*x^(2*r)*e^2 + 4096*b*x^4*x^(3*r)*e^3*log(c) + 4096*a*x^4*x
^(3*r)*e^3)/(9*r^6 + 132*r^5 + 772*r^4 + 2304*r^3 + 3712*r^2 + 3072*r + 102
4)
```

maple [C] time = 0.49, size = 4027, normalized size = 27.03

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+e*x^r)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/4*b*x^4*(4*e^3*r^2*(x^r)^3+18*d*e^2*r^2*(x^r)^2+24*e^3*r*(x^r)^3+3*d^3*r^
3+36*d^2*e*r^2*x^r+96*d*e^2*r*(x^r)^2+32*e^3*(x^r)^3+22*d^3*r^2+120*d^2*e*r
*x^r+96*d*e^2*(x^r)^2+48*d^3*r+96*d^2*e*x^r+32*d^3)/(4+3*r)/(r+2)/(r+4)*ln(
```

x^n)-1/16*x^4*(-6144*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-6144*I*Pi
*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+18*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)-528*a*d^3*r^5-3088*a*d^3*r^4+216*I*Pi*b*d^2*e*r^5*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+9*b*d^3*n*r^6+132*b*d^3*n*r^5+772*b*d^3*n*
r^4-4096*a*e^3*(x^r)^3-4096*a*d^3+18048*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^
r+15360*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+2048*I*Pi*b*e^3*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+6528*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)
^2-6528*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-6528*I*Pi*b*d*
e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+3968*I*Pi*b*e^3*r^2*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*(x^r)^3-36*ln(c)*b*d^3*r^6-528*ln(c)*b*d^3*r^5-3088*
ln(c)*b*d^3*r^4-9216*ln(c)*b*d^3*r^3-14848*ln(c)*b*d^3*r^2-12288*ln(c)*b*d^
3*r-36*a*d^3*r^6+1024*b*d^3*n-48*a*e^3*r^5*(x^r)^3-640*a*e^3*r^4*(x^r)^3-40
96*ln(c)*b*e^3*(x^r)^3+1024*b*e^3*n*(x^r)^3-3264*a*e^3*r^3*(x^r)^3-7936*a*e
^3*r^2*(x^r)^3-9216*a*e^3*r*(x^r)^3-12288*a*d*e^2*(x^r)^2-12288*a*d^2*e*x^r
-4096*b*d^3*ln(c)+2304*b*d^3*n*r^3+3712*b*d^3*n*r^2+3072*b*d^3*n*r-9216*a*d
^3*r^3-14848*a*d^3*r^2-12288*a*d^3*r-30720*ln(c)*b*d*e^2*r*(x^r)^2-18624*ln
(c)*b*d^2*e*r^3*x^r-36096*ln(c)*b*d^2*e*r^2*x^r-33792*ln(c)*b*d^2*e*r*x^r-1
3056*ln(c)*b*d*e^2*r^3*(x^r)^2-29184*ln(c)*b*d*e^2*r^2*(x^r)^2+7680*b*d^2*e
*n*r*x^r+4224*b*d*e^2*n*r^2*(x^r)^2+7104*b*d^2*e*n*r^2*x^r-18048*I*Pi*b*d^2
*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+320*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*(x^r)^3-216*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2
*x^r+2048*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-264*I*Pi*b*d^3*r^5
*csgn(I*c*x^n)^2*csgn(I*c)-1544*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-
1544*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)+4608*I*Pi*b*e^3*r*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+9312*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)*x^r+14592*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
c)(x^r)^2+18048*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-
24*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+7424*I*Pi*b*d^3*r^2*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+264*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+1544*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1632*I
*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+6144*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r
+24*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3+320*I*Pi*b*e^3*r^4*csgn(I*c*x^n)
^3*(x^r)^3+3072*b*d^2*e*n*x^r-13056*a*d*e^2*r^3*(x^r)^2-29184*a*d*e^2*r^2*(
x^r)^2-30720*a*d*e^2*r*(x^r)^2-18624*a*d^2*e*r^3*x^r-36096*a*d^2*e*r^2*x^r+
2304*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+16896*I*Pi*b*d^2*e*r*csgn(I*c*x^n
)^3*x^r-6144*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-6144*I*Pi*b*d
*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+15360*I*Pi*b*d*e^2*r*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*(x^r)^2+16896*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*x^r+108*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^
r)^2-216*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r-1368*I*Pi*b*d*e^2*r
^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-1368*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^
2*csgn(I*c)*(x^r)^2-2304*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-2
64*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2-2048*I*Pi*b*e^3*csgn(I*c*x^n)
^2*csgn(I*c)*(x^r)^3+6144*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2+4608*I*Pi*b*
d^3*r^3*csgn(I*c*x^n)^3+7424*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3+6144*I*Pi*b*d^3
*r*csgn(I*c*x^n)^3-2048*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-2048*I*Pi*b*
d^3*csgn(I*c*x^n)^2*csgn(I*c)-7424*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)
^2-7424*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)-4608*I*Pi*b*d^3*r^3*csgn(I
*x^n)*csgn(I*c*x^n)^2-18048*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-
15360*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-108*I*Pi*b*d*e^2*r
^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-108*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2
*csgn(I*c)*(x^r)^2+18*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+264*I*Pi*b*d^3*r^5*csg
n(I*c*x^n)^3+1544*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3+2048*I*Pi*b*e^3*csgn(I*c*x
^n)^3*(x^r)^3+2048*I*Pi*b*d^3*csgn(I*c*x^n)^3+192*b*e^3*n*r^3*(x^r)^3-216*a
*d*e^2*r^5*(x^r)^2-2736*a*d*e^2*r^4*(x^r)^2-432*a*d^2*e*r^5*x^r-4608*a*d^2*
e*r^4*x^r+832*b*e^3*n*r^2*(x^r)^3+1536*b*e^3*n*r*(x^r)^3+3072*b*d*e^2*n*(x^
r)^2-9312*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-9312*I*Pi*b*d^2*
e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+16*b*e^3*n*r^4*(x^r)^3-33792*a*d^2*e*r*
x^r-12288*ln(c)*b*d^2*e*x^r-12288*ln(c)*b*d*e^2*(x^r)^2-48*ln(c)*b*e^3*r^5*

```
(x^r)^3-640*ln(c)*b*e^3*r^4*(x^r)^3-3264*ln(c)*b*e^3*r^3*(x^r)^3-7936*ln(c)
*b*e^3*r^2*(x^r)^3-9216*ln(c)*b*e^3*r*(x^r)^3+4608*I*Pi*b*d^3*r^3*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-3968*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x
^r)^3-4608*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)-6144*I*Pi*b*d^3*r*csgn(
I*x^n)*csgn(I*c*x^n)^2-6144*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)-16896*I*
Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+6144*I*Pi*b*d*e^2*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*(x^r)^2+6144*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)*x^r-320*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+216*I*Pi*
b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r+1368*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)
^2-14592*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-14592*I*Pi*b*
d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+1632*I*Pi*b*e^3*r^3*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-18*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c
)+6144*b*d*e^2*n*r*(x^r)^2-216*ln(c)*b*d*e^2*r^5*(x^r)^2-2736*ln(c)*b*d*e^2
*r^4*(x^r)^2-432*ln(c)*b*d^2*e*r^5*x^r-4608*ln(c)*b*d^2*e*r^4*x^r+108*b*d*e
^2*n*r^4*(x^r)^2+1152*b*d*e^2*n*r^3*(x^r)^2+432*b*d^2*e*n*r^4*x^r+2880*b*d^
2*e*n*r^3*x^r+108*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2-320*I*Pi*b*e^3*r
^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+9312*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^
3*x^r+14592*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-4608*I*Pi*b*e^3*r*csgn
(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-4608*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)
*(x^r)^3-18*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2-2304*I*Pi*b*d^2*e*r^
4*csgn(I*c*x^n)^2*csgn(I*c)*x^r+24*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*(x^r)^3-15360*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-1
6896*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-3968*I*Pi*b*e^3*r^2*csg
n(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-1632*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I
*c)*(x^r)^3-1632*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-24*I*Pi
*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+1368*I*Pi*b*d*e^2*r^4*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+2304*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*x^r+6528*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*(x^r)^2+6144*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2048*
I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+4608*I*Pi*b*e^3*r*csgn(I*c*x
^n)^3*(x^r)^3+3968*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3)/(4+3*r)^2/(r+2)^
2/(r+4)^2
```

maxima [A] time = 1.04, size = 222, normalized size = 1.49

$$-\frac{1}{16}\,bd^3nx^4+\frac{1}{4}\,bd^3x^4\log\left(cx^n\right)+\frac{1}{4}\,ad^3x^4+\frac{be^3x^{3\,r+4}\log\left(cx^n\right)}{3\,r+4}+\frac{3\,bde^2x^{2\,r+4}\log\left(cx^n\right)}{2\,(r+2)}+\frac{3\,bd^2ex^{r+4}\log\left(cx^n\right)}{r+4}-\frac{be^3}{(3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/16*b*d^3*n*x^4 + 1/4*b*d^3*x^4*log(c*x^n) + 1/4*a*d^3*x^4 + b*e^3*x^(3*r
 + 4)*log(c*x^n)/(3*r + 4) + 3/2*b*d*e^2*x^(2*r + 4)*log(c*x^n)/(r + 2) + 3
*b*d^2*e*x^(r + 4)*log(c*x^n)/(r + 4) - b*e^3*n*x^(3*r + 4)/(3*r + 4)^2 + a
*e^3*x^(3*r + 4)/(3*r + 4) - 3/4*b*d*e^2*n*x^(2*r + 4)/(r + 2)^2 + 3/2*a*d*
e^2*x^(2*r + 4)/(r + 2) - 3*b*d^2*e*n*x^(r + 4)/(r + 4)^2 + 3*a*d^2*e*x^(r
+ 4)/(r + 4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^3\,{\left(d+e\,x^r\right)}^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d + e*x^r)^3*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^3*(d + e*x^r)^3*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.394 $\int x\left(d+ex^r\right)^3\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=149

$$\frac{1}{2}\left(d^3x^2+\frac{6d^2ex^{r+2}}{r+2}+\frac{3de^2x^{2(r+1)}}{r+1}+\frac{2e^3x^{3r+2}}{3r+2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bd^3nx^2-\frac{3bd^2enx^{r+2}}{(r+2)^2}-\frac{3bde^2nx^{2(r+1)}}{4(r+1)^2}-\frac{be^3nx}{(3r+}$$

```
[Out] -1/4*b*d^3*n*x^2-3/4*b*d*e^2*n*x^(2+2*r)/(1+r)^2-3*b*d^2*e*n*x^(2+r)/(2+r)^
2-b*e^3*n*x^(2+3*r)/(2+3*r)^2+1/2*(d^3*x^2+3*d*e^2*x^(2+2*r)/(1+r)+6*d^2*e*
x^(2+r)/(2+r)+2*e^3*x^(2+3*r)/(2+3*r))*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.35, antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {270, 2334, 12, 14}

$$\frac{1}{2}\left(\frac{6d^2ex^{r+2}}{r+2}+d^3x^2+\frac{3de^2x^{2(r+1)}}{r+1}+\frac{2e^3x^{3r+2}}{3r+2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r+2}}{(r+2)^2}-\frac{1}{4}bd^3nx^2-\frac{3bde^2nx^{2(r+1)}}{4(r+1)^2}-\frac{be^3nx}{(3r+}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^2)/4 - (3*b*d*e^2*n*x^(2*(1 + r)))/(4*(1 + r)^2) - (3*b*d^2*e*n
*x^(2 + r))/(2 + r)^2 - (b*e^3*n*x^(2 + 3*r))/(2 + 3*r)^2 + ((d^3*x^2 + (3*
d*e^2*x^(2*(1 + r)))/(1 + r) + (6*d^2*e*x^(2 + r))/(2 + r) + (2*e^3*x^(2 +
3*r))/(2 + 3*r))*(a + b*Log[c*x^n]))/2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x\left(d+ex^r\right)^3\left(a+b\log\left(cx^n\right)\right)\,dx = \frac{1}{2}\left(d^3x^2+\frac{3de^2x^{2(1+r)}}{1+r}+\frac{6d^2ex^{2+r}}{2+r}+\frac{2e^3x^{2+3r}}{2+3r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{2}$$
$$=\frac{1}{2}\left(d^3x^2+\frac{3de^2x^{2(1+r)}}{1+r}+\frac{6d^2ex^{2+r}}{2+r}+\frac{2e^3x^{2+3r}}{2+3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int$$
$$=\frac{1}{2}\left(d^3x^2+\frac{3de^2x^{2(1+r)}}{1+r}+\frac{6d^2ex^{2+r}}{2+r}+\frac{2e^3x^{2+3r}}{2+3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int$$
$$=-\frac{1}{4}bd^3nx^2-\frac{3bde^2nx^{2(1+r)}}{4(1+r)^2}-\frac{3bd^2enx^{2+r}}{(2+r)^2}-\frac{be^3nx^{2+3r}}{(2+3r)^2}+\frac{1}{2}\left(d^3x^2+\frac{3de^2x^{2(1}}{1+r}\right.$$

Mathematica [A] time = 0.36, size = 178, normalized size = 1.19

$$\frac{1}{4}x^2\left(2a\left(d^3+\frac{6d^2ex^r}{r+2}+\frac{3de^2x^{2r}}{r+1}+\frac{2e^3x^{3r}}{3r+2}\right)+2b\log\left(cx^n\right)\left(d^3+\frac{6d^2ex^r}{r+2}+\frac{3de^2x^{2r}}{r+1}+\frac{2e^3x^{3r}}{3r+2}\right)+bn\left(-d^3-\frac{12d^2ex^r}{(r+2)^2}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(b*n*(-d^3 - (12*d^2*e*x^r)/(2 + r)^2 - (3*d*e^2*x^(2*r))/(1 + r)^2 -
(4*e^3*x^(3*r))/(2 + 3*r)^2) + 2*a*(d^3 + (6*d^2*e*x^r)/(2 + r) + (3*d*e^2*
x^(2*r))/(1 + r) + (2*e^3*x^(3*r))/(2 + 3*r)) + 2*b*(d^3 + (6*d^2*e*x^r)/(2
 + r) + (3*d*e^2*x^(2*r))/(1 + r) + (2*e^3*x^(3*r))/(2 + 3*r))*Log[c*x^n]))
/4
```

fricas [B] time = 0.46, size = 1024, normalized size = 6.87

$$\frac{2\left(9\,bd^3r^6+66\,bd^3r^5+193\,bd^3r^4+288\,bd^3r^3+232\,bd^3r^2+96\,bd^3r+16\,bd^3\right)x^2\log(c)+2\left(9\,bd^3nr^6+66\,bd^3nr^5\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*(9*b*d^3*r^6 + 66*b*d^3*r^5 + 193*b*d^3*r^4 + 288*b*d^3*r^3 + 232*b*
d^3*r^2 + 96*b*d^3*r + 16*b*d^3)*x^2*log(c) + 2*(9*b*d^3*n*r^6 + 66*b*d^3*n
*r^5 + 193*b*d^3*n*r^4 + 288*b*d^3*n*r^3 + 232*b*d^3*n*r^2 + 96*b*d^3*n*r +
 16*b*d^3*n)*x^2*log(x) - (9*(b*d^3*n - 2*a*d^3)*r^6 + 66*(b*d^3*n - 2*a*d^
3)*r^5 + 16*b*d^3*n + 193*(b*d^3*n - 2*a*d^3)*r^4 - 32*a*d^3 + 288*(b*d^3*n
 - 2*a*d^3)*r^3 + 232*(b*d^3*n - 2*a*d^3)*r^2 + 96*(b*d^3*n - 2*a*d^3)*r)*x
^2 + 4*((3*b*e^3*r^5 + 20*b*e^3*r^4 + 51*b*e^3*r^3 + 62*b*e^3*r^2 + 36*b*e^
3*r + 8*b*e^3)*x^2*log(c) + (3*b*e^3*n*r^5 + 20*b*e^3*n*r^4 + 51*b*e^3*n*r^
3 + 62*b*e^3*n*r^2 + 36*b*e^3*n*r + 8*b*e^3*n)*x^2*log(x) + (3*a*e^3*r^5 -
4*b*e^3*n - (b*e^3*n - 20*a*e^3)*r^4 + 8*a*e^3 - 3*(2*b*e^3*n - 17*a*e^3)*r
^3 - (13*b*e^3*n - 62*a*e^3)*r^2 - 12*(b*e^3*n - 3*a*e^3)*r)*x^2)*x^(3*r) +
 3*(2*(9*b*d*e^2*r^5 + 57*b*d*e^2*r^4 + 136*b*d*e^2*r^3 + 152*b*d*e^2*r^2 +
 80*b*d*e^2*r + 16*b*d*e^2)*x^2*log(c) + 2*(9*b*d*e^2*n*r^5 + 57*b*d*e^2*n*
r^4 + 136*b*d*e^2*n*r^3 + 152*b*d*e^2*n*r^2 + 80*b*d*e^2*n*r + 16*b*d*e^2*n
)*x^2*log(x) + (18*a*d*e^2*r^5 - 16*b*d*e^2*n - 3*(3*b*d*e^2*n - 38*a*d*e^2
)*r^4 + 32*a*d*e^2 - 16*(3*b*d*e^2*n - 17*a*d*e^2)*r^3 - 8*(11*b*d*e^2*n -
38*a*d*e^2)*r^2 - 32*(2*b*d*e^2*n - 5*a*d*e^2)*r)*x^2)*x^(2*r) + 12*((9*b*d
^2*e*r^5 + 48*b*d^2*e*r^4 + 97*b*d^2*e*r^3 + 94*b*d^2*e*r^2 + 44*b*d^2*e*r
+ 8*b*d^2*e)*x^2*log(c) + (9*b*d^2*e*n*r^5 + 48*b*d^2*e*n*r^4 + 97*b*d^2*e*
n*r^3 + 94*b*d^2*e*n*r^2 + 44*b*d^2*e*n*r + 8*b*d^2*e*n)*x^2*log(x) + (9*a*
d^2*e*r^5 - 4*b*d^2*e*n - 3*(3*b*d^2*e*n - 16*a*d^2*e)*r^4 + 8*a*d^2*e - (3
0*b*d^2*e*n - 97*a*d^2*e)*r^3 - (37*b*d^2*e*n - 94*a*d^2*e)*r^2 - 4*(5*b*d^
```

```
2*e*n - 11*a*d^2*e)*r)*x^2)*x^r)/(9*r^6 + 66*r^5 + 193*r^4 + 288*r^3 + 232*
r^2 + 96*r + 16)
```

giac [B] time = 0.54, size = 1588, normalized size = 10.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/4*(18*b*d^3*n*r^6*x^2*log(x) + 108*b*d^2*n*r^5*x^2*x^r*e*log(x) - 9*b*d^3
*n*r^6*x^2 + 18*b*d^3*r^6*x^2*log(c) + 108*b*d^2*r^5*x^2*x^r*e*log(c) + 132
*b*d^3*n*r^5*x^2*log(x) + 54*b*d*n*r^5*x^2*x^(2*r)*e^2*log(x) + 576*b*d^2*n
*r^4*x^2*x^r*e*log(x) - 66*b*d^3*n*r^5*x^2 + 18*a*d^3*r^6*x^2 - 108*b*d^2*n
*r^4*x^2*x^r*e + 108*a*d^2*r^5*x^2*x^r*e + 132*b*d^3*r^5*x^2*log(c) + 54*b*
d*r^5*x^2*x^(2*r)*e^2*log(c) + 576*b*d^2*r^4*x^2*x^r*e*log(c) + 386*b*d^3*n
*r^4*x^2*log(x) + 12*b*n*r^5*x^2*x^(3*r)*e^3*log(x) + 342*b*d*n*r^4*x^2*x^(
2*r)*e^2*log(x) + 1164*b*d^2*n*r^3*x^2*x^r*e*log(x) - 193*b*d^3*n*r^4*x^2 +
 132*a*d^3*r^5*x^2 - 27*b*d*n*r^4*x^2*x^(2*r)*e^2 + 54*a*d*r^5*x^2*x^(2*r)*
e^2 - 360*b*d^2*n*r^3*x^2*x^r*e + 576*a*d^2*r^4*x^2*x^r*e + 386*b*d^3*r^4*x
^2*log(c) + 12*b*r^5*x^2*x^(3*r)*e^3*log(c) + 342*b*d*r^4*x^2*x^(2*r)*e^2*l
og(c) + 1164*b*d^2*r^3*x^2*x^r*e*log(c) + 576*b*d^3*n*r^3*x^2*log(x) + 80*b
*n*r^4*x^2*x^(3*r)*e^3*log(x) + 816*b*d*n*r^3*x^2*x^(2*r)*e^2*log(x) + 1128
*b*d^2*n*r^2*x^2*x^r*e*log(x) - 288*b*d^3*n*r^3*x^2 + 386*a*d^3*r^4*x^2 - 4
*b*n*r^4*x^2*x^(3*r)*e^3 + 12*a*r^5*x^2*x^(3*r)*e^3 - 144*b*d*n*r^3*x^2*x^(
2*r)*e^2 + 342*a*d*r^4*x^2*x^(2*r)*e^2 - 444*b*d^2*n*r^2*x^2*x^r*e + 1164*a
*d^2*r^3*x^2*x^r*e + 576*b*d^3*r^3*x^2*log(c) + 80*b*r^4*x^2*x^(3*r)*e^3*lo
g(c) + 816*b*d*r^3*x^2*x^(2*r)*e^2*log(c) + 1128*b*d^2*r^2*x^2*x^r*e*log(c)
 + 464*b*d^3*n*r^2*x^2*log(x) + 204*b*n*r^3*x^2*x^(3*r)*e^3*log(x) + 912*b*
d*n*r^2*x^2*x^(2*r)*e^2*log(x) + 528*b*d^2*n*r*x^2*x^r*e*log(x) - 232*b*d^3
*n*r^2*x^2 + 576*a*d^3*r^3*x^2 - 24*b*n*r^3*x^2*x^(3*r)*e^3 + 80*a*r^4*x^2*
x^(3*r)*e^3 - 264*b*d*n*r^2*x^2*x^(2*r)*e^2 + 816*a*d*r^3*x^2*x^(2*r)*e^2 -
 240*b*d^2*n*r*x^2*x^r*e + 1128*a*d^2*r^2*x^2*x^r*e + 464*b*d^3*r^2*x^2*log
(c) + 204*b*r^3*x^2*x^(3*r)*e^3*log(c) + 912*b*d*r^2*x^2*x^(2*r)*e^2*log(c)
 + 528*b*d^2*r*x^2*x^r*e*log(c) + 192*b*d^3*n*r*x^2*log(x) + 248*b*n*r^2*x^
2*x^(3*r)*e^3*log(x) + 480*b*d*n*r*x^2*x^(2*r)*e^2*log(x) + 96*b*d^2*n*x^2*
x^r*e*log(x) - 96*b*d^3*n*r*x^2 + 464*a*d^3*r^2*x^2 - 52*b*n*r^2*x^2*x^(3*r
)*e^3 + 204*a*r^3*x^2*x^(3*r)*e^3 - 192*b*d*n*r*x^2*x^(2*r)*e^2 + 912*a*d*r
^2*x^2*x^(2*r)*e^2 - 48*b*d^2*n*x^2*x^r*e + 528*a*d^2*r*x^2*x^r*e + 192*b*d
^3*r*x^2*log(c) + 248*b*r^2*x^2*x^(3*r)*e^3*log(c) + 480*b*d*r*x^2*x^(2*r)*
e^2*log(c) + 96*b*d^2*x^2*x^r*e*log(c) + 32*b*d^3*n*x^2*log(x) + 144*b*n*r*
x^2*x^(3*r)*e^3*log(x) + 96*b*d*n*x^2*x^(2*r)*e^2*log(x) - 16*b*d^3*n*x^2 +
 192*a*d^3*r*x^2 - 48*b*n*r*x^2*x^(3*r)*e^3 + 248*a*r^2*x^2*x^(3*r)*e^3 - 4
8*b*d*n*x^2*x^(2*r)*e^2 + 480*a*d*r*x^2*x^(2*r)*e^2 + 96*a*d^2*x^2*x^r*e +
32*b*d^3*x^2*log(c) + 144*b*r*x^2*x^(3*r)*e^3*log(c) + 96*b*d*x^2*x^(2*r)*e
^2*log(c) + 32*b*n*x^2*x^(3*r)*e^3*log(x) + 32*a*d^3*x^2 - 16*b*n*x^2*x^(3*
r)*e^3 + 144*a*r*x^2*x^(3*r)*e^3 + 96*a*d*x^2*x^(2*r)*e^2 + 32*b*x^2*x^(3*r
)*e^3*log(c) + 32*a*x^2*x^(3*r)*e^3)/(9*r^6 + 66*r^5 + 193*r^4 + 288*r^3 +
232*r^2 + 96*r + 16)
```

maple [C] time = 0.49, size = 4027, normalized size = 27.03

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+e*x^r)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/2*b*x^2*(2*e^3*r^2*(x^r)^3+9*d*e^2*r^2*(x^r)^2+6*e^3*r*(x^r)^3+3*d^3*r^3+
18*d^2*e*r^2*x^r+24*d*e^2*r*(x^r)^2+4*e^3*(x^r)^3+11*d^3*r^2+30*d^2*e*r*x^r
```

+12*d*e^2*(x^r)^2+12*d^3*r+12*d^2*e*x^r+4*d^3)/(2+3*r)/(r+1)/(r+2)*ln(x^n)-
1/4*x^2*(-132*a*d^3*r^5-386*a*d^3*r^4+171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)*(x^r)^2+9*b*d^3*n*r^6+66*b*d^3*n*r^5+193*b*d^3*n*r^4-32
*a*e^3*(x^r)^3-32*a*d^3-102*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^
3-102*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-40*I*Pi*b*e^3*r^4*
csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-6*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x
^n)^2*(x^r)^3-40*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-18*ln(c)*
b*d^3*r^6-132*ln(c)*b*d^3*r^5-386*ln(c)*b*d^3*r^4-576*ln(c)*b*d^3*r^3-464*l
n(c)*b*d^3*r^2-192*ln(c)*b*d^3*r-18*a*d^3*r^6+16*b*d^3*n-12*a*e^3*r^5*(x^r)
^3-80*a*e^3*r^4*(x^r)^3-32*ln(c)*b*e^3*(x^r)^3+16*b*e^3*n*(x^r)^3-204*a*e^3
r^3(x^r)^3-248*a*e^3*r^2*(x^r)^3-144*a*e^3*r*(x^r)^3-96*a*d*e^2*(x^r)^2-9
6*a*d^2*e*x^r-32*b*d^3*ln(c)+288*b*d^3*n*r^3+232*b*d^3*n*r^2+96*b*d^3*n*r-5
76*a*d^3*r^3-464*a*d^3*r^2-192*a*d^3*r-480*ln(c)*b*d*e^2*r*(x^r)^2-1164*ln(
c)*b*d^2*e*r^3*x^r-1128*ln(c)*b*d^2*e*r^2*x^r-528*ln(c)*b*d^2*e*r*x^r-816*l
n(c)*b*d*e^2*r^3*(x^r)^2-912*ln(c)*b*d*e^2*r^2*(x^r)^2+240*b*d^2*e*n*r*x^r+
264*b*d*e^2*n*r^2*(x^r)^2+444*b*d^2*e*n*r^2*x^r+48*I*Pi*b*d^2*e*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*x^r-564*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)
*x^r-240*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+564*I*Pi*b*d^2*
e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+240*I*Pi*b*d*e^2*r*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-193*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x
^n)^2-193*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)-9*I*Pi*b*d^3*r^6*csgn(I*
x^n)*csgn(I*c*x^n)^2+288*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*x^r-240*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-264*I*Pi*b*d^2*
e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-264*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn
(I*c)*x^r+48*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+48*I*
Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+40*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3-23
2*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+48*b*d^2*e*n*x^r-816*a*d*e^2*r
^3*(x^r)^2-912*a*d*e^2*r^2*(x^r)^2-480*a*d*e^2*r*(x^r)^2-1164*a*d^2*e*r^3*x
^r-1128*a*d^2*e*r^2*x^r-54*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r
+232*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+288*I*Pi*b*d^3*r^3*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-124*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn
(I*c)*(x^r)^3-456*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-456*
I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+102*I*Pi*b*e^3*r^3*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+6*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^
r)^3-16*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+582*I*Pi*b*d^2*e*r^3
*csgn(I*c*x^n)^3*x^r+456*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-72*I*Pi*b
*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-232*I*Pi*b*d^3*r^2*csgn(I*c*x^n)
^2*csgn(I*c)-66*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)-288*I*Pi*b*d^3*r^3
*csgn(I*x^n)*csgn(I*c*x^n)^2-288*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)+2
64*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+16*I*Pi*b*d^3*csg
n(I*c*x^n)^3+9*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+193*I*Pi*
b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+24*b*e^3*n*r^3*(x^r)^3-54*a*d
*e^2*r^5*(x^r)^2-342*a*d*e^2*r^4*(x^r)^2-108*a*d^2*e*r^5*x^r-576*a*d^2*e*r^
4*x^r+52*b*e^3*n*r^2*(x^r)^3+48*b*e^3*n*r*(x^r)^3+48*b*d*e^2*n*(x^r)^2-288*
I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-288*I*Pi*b*d^2*e*r^4*csgn(
I*c*x^n)^2*csgn(I*c)*x^r+4*b*e^3*n*r^4*(x^r)^3-528*a*d^2*e*r*x^r-96*ln(c)*b
*d^2*e*x^r-96*ln(c)*b*d*e^2*(x^r)^2-12*ln(c)*b*e^3*r^5*(x^r)^3-80*ln(c)*b*e
^3*r^4*(x^r)^3-204*ln(c)*b*e^3*r^3*(x^r)^3-248*ln(c)*b*e^3*r^2*(x^r)^3-144*
ln(c)*b*e^3*r*(x^r)^3-48*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-4
8*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-48*I*Pi*b*d^2*e*csgn(I*x^n
)*csgn(I*c*x^n)^2*x^r+66*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
-72*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+564*I*Pi*b*d^2*e*r^2*csg
n(I*c*x^n)^3*x^r+240*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-96*I*Pi*b*d^3*r
*csgn(I*x^n)*csgn(I*c*x^n)^2-96*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)-66*I
*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2+16*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)+6*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)
^3-27*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+27*I*Pi*b*d*e^2*
r^5*csgn(I*c*x^n)^3*(x^r)^2-582*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^
2*x^r-582*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+72*I*Pi*b*e^3*r*cs

```
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-564*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*
csgn(I*c*x^n)^2*x^r-16*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+9*I*Pi*b*d^3*r^
6*csgn(I*c*x^n)^3+193*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3+16*I*Pi*b*e^3*csgn(I*c
*x^n)^3*(x^r)^3-171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-27*I
*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+96*I*Pi*b*d^3*r*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+192*b*d*e^2*n*r*(x^r)^2-54*ln(c)*b*d*e^2*r^5*(x^
r)^2-342*ln(c)*b*d*e^2*r^4*(x^r)^2-108*ln(c)*b*d^2*e*r^5*x^r-576*ln(c)*b*d^
2*e*r^4*x^r+27*b*d*e^2*n*r^4*(x^r)^2+144*b*d*e^2*n*r^3*(x^r)^2+108*b*d^2*e*
n*r^4*x^r+360*b*d^2*e*n*r^3*x^r+288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+26
4*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r+288*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3+232
*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3+96*I*Pi*b*d^3*r*csgn(I*c*x^n)^3-16*I*Pi*b*d
^3*csgn(I*x^n)*csgn(I*c*x^n)^2+16*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*(x^r)^3+408*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-124*I*Pi*b*e^3*r
^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-9*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csg
n(I*c)-16*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+48*I*Pi*b*d*e^2*csgn
(I*c*x^n)^3*(x^r)^2-54*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r-408*I
*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-408*I*Pi*b*d*e^2*r^3*cs
gn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+124*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)*(x^r)^3+171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2+54*I*Pi*b*
d^2*e*r^5*csgn(I*c*x^n)^3*x^r+40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)*(x^r)^3-171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+4
56*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-48*I*Pi*b*d
^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+27*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)*(x^r)^2+54*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*x^r+66*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3+408*I*Pi*b*d*e^2*r^3*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+582*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*x^r-6*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+72*I*
Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3+124*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)
^3+102*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3)/(2+3*r)^2/(r+1)^2/(r+2)^2
```

maxima [A] time = 1.01, size = 222, normalized size = 1.49

$$-\frac{1}{4}\,bd^3nx^2+\frac{1}{2}\,bd^3x^2\log\left(cx^n\right)+\frac{1}{2}\,ad^3x^2+\frac{be^3x^{3\,r+2}\log\left(cx^n\right)}{3\,r+2}+\frac{3\,bde^2x^{2\,r+2}\log\left(cx^n\right)}{2\,(r+1)}+\frac{3\,bd^2ex^{r+2}\log\left(cx^n\right)}{r+2}-\frac{be^3n}{(3\,r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/4*b*d^3*n*x^2 + 1/2*b*d^3*x^2*log(c*x^n) + 1/2*a*d^3*x^2 + b*e^3*x^(3*r
+ 2)*log(c*x^n)/(3*r + 2) + 3/2*b*d*e^2*x^(2*r + 2)*log(c*x^n)/(r + 1) + 3*
b*d^2*e*x^(r + 2)*log(c*x^n)/(r + 2) - b*e^3*n*x^(3*r + 2)/(3*r + 2)^2 + a*
e^3*x^(3*r + 2)/(3*r + 2) - 3/4*b*d*e^2*n*x^(2*r + 2)/(r + 1)^2 + 3/2*a*d*e
^2*x^(2*r + 2)/(r + 1) - 3*b*d^2*e*n*x^(r + 2)/(r + 2)^2 + 3*a*d^2*e*x^(r +
 2)/(r + 2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,{\left(d+e\,x^r\right)}^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d + e*x^r)^3*(a + b*log(c*x^n)),x)
```

```
[Out] int(x*(d + e*x^r)^3*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.395 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=152

$$d^3\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{3d^2ex^r\left(a+b\log\left(cx^n\right)\right)}{r}+\frac{3de^2x^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r}+\frac{e^3x^{3r}\left(a+b\log\left(cx^n\right)\right)}{3r}-\frac{1}{2}bd^3n$$

```
[Out] -3*b*d^2*e*n*x^r/r^2-3/4*b*d*e^2*n*x^(2*r)/r^2-1/9*b*e^3*n*x^(3*r)/r^2-1/2*
b*d^3*n*ln(x)^2+3*d^2*e*x^r*(a+b*ln(c*x^n))/r+3/2*d*e^2*x^(2*r)*(a+b*ln(c*x
^n))/r+1/3*e^3*x^(3*r)*(a+b*ln(c*x^n))/r+d^3*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.17, antiderivative size = 124, normalized size of antiderivative = 0.82, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$\frac{1}{6}\left(\frac{18d^2ex^r}{r}+6d^3\log(x)+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^r}{r^2}-\frac{1}{2}bd^3n\log^2(x)-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^3}{9r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-3*b*d^2*e*n*x^r)/r^2 - (3*b*d*e^2*n*x^(2*r))/(4*r^2) - (b*e^3*n*x^(3*r))/
(9*r^2) - (b*d^3*n*Log[x]^2)/2 + (((18*d^2*e*x^r)/r + (9*d*e^2*x^(2*r))/r +
 (2*e^3*x^(3*r))/r + 6*d^3*Log[x])*(a + b*Log[c*x^n]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
```

```
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^3\left(a+b\log(cx^n)\right)}{x}dx = \frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)\left(a+b\log(cx^n)\right)-(bn)\int \frac{ex^r}{\ldots}$$

$$= \frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)\left(a+b\log(cx^n)\right)-\frac{(bn)\int \frac{ex^r(18\ldots}{\ldots}}{\ldots}$$

$$= \frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)\left(a+b\log(cx^n)\right)-\frac{(bn)\int\left(18d\ldots\right.}{\ldots}$$

$$= -\frac{3bd^2enx^r}{r^2}-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^{3r}}{9r^2}+\frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\mathrm{l}\ldots\right.$$

$$= -\frac{3bd^2enx^r}{r^2}-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^{3r}}{9r^2}-\frac{1}{2}bd^3n\log^2(x)+\frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}\ldots\right.$$

Mathematica [A] time = 0.37, size = 132, normalized size = 0.87

$$\frac{1}{36}\left(\frac{ex^r\left(6ar\left(18d^2+9dex^r+2e^2x^{2r}\right)-bn\left(108d^2+27dex^r+4e^2x^{2r}\right)\right)}{r^2}+\frac{18bd^3\log^2(cx^n)}{n}+\frac{6bex^r\log(cx^n)\left(18d^2\ldots\right.}{r}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] a*d^3*Log[x] + ((e*x^r*(6*a*r*(18*d^2 + 9*d*e*x^r + 2*e^2*x^(2*r)) - b*n*(1
08*d^2 + 27*d*e*x^r + 4*e^2*x^(2*r))))/r^2 + (6*b*e*x^r*(18*d^2 + 9*d*e*x^r
 + 2*e^2*x^(2*r))*Log[c*x^n])/r + (18*b*d^3*Log[c*x^n]^2)/n)/36
```

fricas [A] time = 0.44, size = 169, normalized size = 1.11

$$\frac{18\,bd^3nr^2\log(x)^2+4\left(3\,be^3nr\log(x)+3\,be^3r\log(c)-be^3n+3\,ae^3r\right)x^{3\,r}+27\left(2\,bde^2nr\log(x)+2\,bde^2r\log(c)-\ldots\right.}{36\,r\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/36*(18*b*d^3*n*r^2*log(x)^2 + 4*(3*b*e^3*n*r*log(x) + 3*b*e^3*r*log(c) -
b*e^3*n + 3*a*e^3*r)*x^(3*r) + 27*(2*b*d*e^2*n*r*log(x) + 2*b*d*e^2*r*log(c
) - b*d*e^2*n + 2*a*d*e^2*r)*x^(2*r) + 108*(b*d^2*e*n*r*log(x) + b*d^2*e*r*
log(c) - b*d^2*e*n + a*d^2*e*r)*x^r + 36*(b*d^3*r^2*log(c) + a*d^3*r^2)*log
(x))/r^2
```

giac [A] time = 0.37, size = 210, normalized size = 1.38

$$\frac{1}{2}\,bd^3n\log(x)^2+\frac{3\,bd^2nx^re\log(x)}{r}+bd^3\log(c)\log(x)+\frac{3\,bd^2x^re\log(c)}{r}+ad^3\log(x)+\frac{3\,bdnx^{2\,r}e^2\log(x)}{2\,r}-\frac{3\,bd^2nx^re}{r^2}+\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d^3*n*log(x)^2 + 3*b*d^2*n*x^r*e*log(x)/r + b*d^3*log(c)*log(x) + 3*b
*d^2*x^r*e*log(c)/r + a*d^3*log(x) + 3/2*b*d*n*x^(2*r)*e^2*log(x)/r - 3*b*d
^2*n*x^r*e/r^2 + 3*a*d^2*x^r*e/r + 3/2*b*d*x^(2*r)*e^2*log(c)/r + 1/3*b*n*x
^(3*r)*e^3*log(x)/r - 3/4*b*d*n*x^(2*r)*e^2/r^2 + 3/2*a*d*x^(2*r)*e^2/r + 1
/3*b*x^(3*r)*e^3*log(c)/r - 1/9*b*n*x^(3*r)*e^3/r^2 + 1/3*a*x^(3*r)*e^3/r
```

maple [C] time = 0.28, size = 693, normalized size = 4.56

$$\frac{a e^3 x^{3r}}{3r}+\frac{\left(6d^3 r\ln(x)+18d^2 e\,x^r+9d\,e^2x^{2r}+2e^3x^{3r}\right)b\ln\left(x^n\right)}{6r}+b\,d^3\ln(c)\ln(x)+a\,d^3\ln(x)-\frac{i\pi b\,d^3\mathrm{csgn}\left(ic\right)\mathrm{csgn}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] 1/3/r*a*e^3*(x^r)^3+1/6*b*(2*e^3*(x^r)^3+6*d^3*ln(x)*r+9*d*e^2*(x^r)^2+18*d
^2*e*x^r)/r*ln(x^n)-1/6*I/r*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+1/2*I*Pi*ln(x)
*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*Pi*ln(x)*b*d^3*csgn(I*c*x^n)^2*csg
n(I*c)+b*d^3*ln(c)*ln(x)+a*d^3*ln(x)+3/2/r*ln(c)*b*d*e^2*(x^r)^2-3/4/r^2*b*
d*e^2*n*(x^r)^2+3/r*ln(c)*b*d^2*e*x^r-1/2*I*Pi*ln(x)*b*d^3*csgn(I*c*x^n)^3+
1/3/r*ln(c)*b*e^3*(x^r)^3-1/9/r^2*b*e^3*n*(x^r)^3+3/2/r*a*d*e^2*(x^r)^2+3/r
*a*d^2*e*x^r-3/4*I/r*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2
-3/2*I/r*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+3/4*I/r*Pi*b*d*
e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+3/4*I/r*Pi*b*d*e^2*csgn(I*c*x^n)^2*
csgn(I*c)*(x^r)^2+3/2*I/r*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+3/2*I/
r*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-1/6*I/r*Pi*b*e^3*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*(x^r)^3-3*b*d^2*e*n*x^r/r^2-1/2*I*Pi*ln(x)*b*d^3*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/6*I/r*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2
*(x^r)^3+1/6*I/r*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-3/4*I/r*Pi*b*d*
e^2*csgn(I*c*x^n)^3*(x^r)^2-3/2*I/r*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r-1/2*b*d^
3*n*ln(x)^2
```

maxima [A] time = 1.04, size = 172, normalized size = 1.13

$$\frac{be^3x^{3\,r}\log\left(cx^n\right)}{3\,r}+\frac{3\,bde^2x^{2\,r}\log\left(cx^n\right)}{2\,r}+\frac{3\,bd^2ex^r\log\left(cx^n\right)}{r}+\frac{bd^3\log\left(cx^n\right)^2}{2\,n}+ad^3\log(x)-\frac{be^3nx^{3\,r}}{9\,r^2}+\frac{ae^3x^{3\,r}}{3\,r}-\frac{3\,bde}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] 1/3*b*e^3*x^(3*r)*log(c*x^n)/r + 3/2*b*d*e^2*x^(2*r)*log(c*x^n)/r + 3*b*d^2
*e*x^r*log(c*x^n)/r + 1/2*b*d^3*log(c*x^n)^2/n + a*d^3*log(x) - 1/9*b*e^3*n
*x^(3*r)/r^2 + 1/3*a*e^3*x^(3*r)/r - 3/4*b*d*e^2*n*x^(2*r)/r^2 + 3/2*a*d*e^
2*x^(2*r)/r - 3*b*d^2*e*n*x^r/r^2 + 3*a*d^2*e*x^r/r
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(d+e\,x^r\right)}^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x,x)
```

```
[Out] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x, x)
```

sympy [A] time = 19.73, size = 286, normalized size = 1.88

$$\begin{cases} ad^3\log(x) + \frac{3ad^2ex^r}{r} + \frac{3ade^2x^{2r}}{2r} + \frac{ae^3x^{3r}}{3r} + \frac{bd^3n\log(x)^2}{2} + bd^3\log(c)\log(x) + \frac{3bd^2enx^r\log(x)}{r} - \frac{3bd^2enx^r}{r^2} + \frac{3bd^2ex^r\log(c)}{r} \\ (d+e)^3\left(\begin{cases} a\log(x) & \text{for } b=0 \\ -\left(-a-b\log(c)\right)\log(x) & \text{for } n=0 \\ \frac{\left(-a-b\log(cx^n)\right)^2}{2bn} & \text{otherwise} \end{cases}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Piecewise((a*d**3*log(x) + 3*a*d**2*e*x**r/r + 3*a*d*e**2*x**(2*r)/(2*r) +
a*e**3*x**(3*r)/(3*r) + b*d**3*n*log(x)**2/2 + b*d**3*log(c)*log(x) + 3*b*d
**2*e*n*x**r*log(x)/r - 3*b*d**2*e*n*x**r/r**2 + 3*b*d**2*e*x**r*log(c)/r +
 3*b*d*e**2*n*x**(2*r)*log(x)/(2*r) - 3*b*d*e**2*n*x**(2*r)/(4*r**2) + 3*b*
d*e**2*x**(2*r)*log(c)/(2*r) + b*e**3*n*x**(3*r)*log(x)/(3*r) - b*e**3*n*x*
*(3*r)/(9*r**2) + b*e**3*x**(3*r)*log(c)/(3*r), Ne(r, 0)), ((d + e)**3*Piec
ewise((a*log(x), Eq(b, 0)), (-(-a - b*log(c))*log(x), Eq(n, 0)), ((-a - b*l
og(c*x**n))**2/(2*b*n), True)), True))
```

3.396 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=191

$$-\frac{d^3(a+b\log(cx^n))}{2x^2}-\frac{3d^2ex^{r-2}(a+b\log(cx^n))}{2-r}-\frac{3de^2x^{-2(1-r)}(a+b\log(cx^n))}{2(1-r)}-\frac{e^3x^{3r-2}(a+b\log(cx^n))}{2-3r}-\frac{bd^3}{4x}$$

```
[Out] -1/4*b*d^3*n/x^2-3/4*b*d*e^2*n/(1-r)^2/(x^(2-2*r))-3*b*d^2*e*n*x^(-2+r)/(2-
r)^2-b*e^3*n*x^(-2+3*r)/(2-3*r)^2-1/2*d^3*(a+b*ln(c*x^n))/x^2-3/2*d*e^2*(a+
b*ln(c*x^n))/(1-r)/(x^(2-2*r))-3*d^2*e*x^(-2+r)*(a+b*ln(c*x^n))/(2-r)-e^3*x
^(-2+3*r)*(a+b*ln(c*x^n))/(2-3*r)
```

Rubi [A] time = 0.41, antiderivative size = 161, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{2}\left(\frac{6d^2ex^{r-2}}{2-r}+\frac{d^3}{x^2}+\frac{3de^2x^{-2(1-r)}}{1-r}+\frac{2e^3x^{3r-2}}{2-3r}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r-2}}{(2-r)^2}-\frac{bd^3n}{4x^2}-\frac{3bde^2nx^{-2(1-r)}}{4(1-r)^2}-\frac{be^3nx^{3r-}}{(2-3r)}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d^3*n)/(4*x^2) - (3*b*d*e^2*n)/(4*(1 - r)^2*x^(2*(1 - r))) - (3*b*d^2*e
*n*x^(-2 + r))/(2 - r)^2 - (b*e^3*n*x^(-2 + 3*r))/(2 - 3*r)^2 - ((d^3/x^2 +
 (3*d*e^2)/((1 - r)*x^(2*(1 - r))) + (6*d^2*e*x^(-2 + r))/(2 - r) + (2*e^3*
x^(-2 + 3*r))/(2 - 3*r))*(a + b*Log[c*x^n]))/2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^3\left(a+b\log\left(cx^n\right)\right)}{x^3}\,dx = -\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{3de^2x^{-2(1-r)}}{1-r}+\frac{6d^2ex^{-2+r}}{2-r}+\frac{2e^3x^{-2+3r}}{2-3r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int$$

$$= -\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{3de^2x^{-2(1-r)}}{1-r}+\frac{6d^2ex^{-2+r}}{2-r}+\frac{2e^3x^{-2+3r}}{2-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int$$

$$= -\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{3de^2x^{-2(1-r)}}{1-r}+\frac{6d^2ex^{-2+r}}{2-r}+\frac{2e^3x^{-2+3r}}{2-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int$$

$$= -\frac{bd^3n}{4x^2}-\frac{3bde^2nx^{-2(1-r)}}{4(1-r)^2}-\frac{3bd^2enx^{-2+r}}{(2-r)^2}-\frac{be^3nx^{-2+3r}}{(2-3r)^2}-\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{3de^2x^{-2(1-r)}}{1-r}\right.$$

Mathematica [A] time = 0.42, size = 181, normalized size = 0.95

$$\frac{a\left(-2d^3+\frac{12d^2ex^r}{r-2}+\frac{6de^2x^{2r}}{r-1}+\frac{4e^3x^{3r}}{3r-2}\right)+2b\log\left(cx^n\right)\left(-d^3+\frac{6d^2ex^r}{r-2}+\frac{3de^2x^{2r}}{r-1}+\frac{2e^3x^{3r}}{3r-2}\right)+bn\left(-d^3-\frac{12d^2ex^r}{(r-2)^2}-\frac{3de^2x^{2r}}{(r-1)^2}-\right.}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] (b*n*(-d^3 - (12*d^2*e*x^r)/(-2 + r)^2 - (3*d*e^2*x^(2*r))/(-1 + r)^2 - (4*
e^3*x^(3*r))/(2 - 3*r)^2) + a*(-2*d^3 + (12*d^2*e*x^r)/(-2 + r) + (6*d*e^2*
x^(2*r))/(-1 + r) + (4*e^3*x^(3*r))/(-2 + 3*r)) + 2*b*(-d^3 + (6*d^2*e*x^r)
/(-2 + r) + (3*d*e^2*x^(2*r))/(-1 + r) + (2*e^3*x^(3*r))/(-2 + 3*r))*Log[c*
x^n])/(4*x^2)
```

fricas [B] time = 0.51, size = 981, normalized size = 5.14

$$-\frac{9\left(bd^3n+2\,ad^3\right)r^6-66\left(bd^3n+2\,ad^3\right)r^5+16\,bd^3n+193\left(bd^3n+2\,ad^3\right)r^4+32\,ad^3-288\left(bd^3n+2\,ad^3\right)r^3+2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] -1/4*(9*(b*d^3*n + 2*a*d^3)*r^6 - 66*(b*d^3*n + 2*a*d^3)*r^5 + 16*b*d^3*n +
 193*(b*d^3*n + 2*a*d^3)*r^4 + 32*a*d^3 - 288*(b*d^3*n + 2*a*d^3)*r^3 + 232
*(b*d^3*n + 2*a*d^3)*r^2 - 96*(b*d^3*n + 2*a*d^3)*r - 4*(3*a*e^3*r^5 - 4*b*
e^3*n - (b*e^3*n + 20*a*e^3)*r^4 - 8*a*e^3 + 3*(2*b*e^3*n + 17*a*e^3)*r^3 -
 (13*b*e^3*n + 62*a*e^3)*r^2 + 12*(b*e^3*n + 3*a*e^3)*r + (3*b*e^3*r^5 - 20
*b*e^3*r^4 + 51*b*e^3*r^3 - 62*b*e^3*r^2 + 36*b*e^3*r - 8*b*e^3)*log(c) + (
3*b*e^3*n*r^5 - 20*b*e^3*n*r^4 + 51*b*e^3*n*r^3 - 62*b*e^3*n*r^2 + 36*b*e^3
*n*r - 8*b*e^3*n)*log(x))*x^(3*r) - 3*(18*a*d*e^2*r^5 - 16*b*d*e^2*n - 3*(3
*b*d*e^2*n + 38*a*d*e^2)*r^4 - 32*a*d*e^2 + 16*(3*b*d*e^2*n + 17*a*d*e^2)*r
^3 - 8*(11*b*d*e^2*n + 38*a*d*e^2)*r^2 + 32*(2*b*d*e^2*n + 5*a*d*e^2)*r + 2
*(9*b*d*e^2*r^5 - 57*b*d*e^2*r^4 + 136*b*d*e^2*r^3 - 152*b*d*e^2*r^2 + 80*b
*d*e^2*r - 16*b*d*e^2)*log(c) + 2*(9*b*d*e^2*n*r^5 - 57*b*d*e^2*n*r^4 + 136
*b*d*e^2*n*r^3 - 152*b*d*e^2*n*r^2 + 80*b*d*e^2*n*r - 16*b*d*e^2*n)*log(x))
*x^(2*r) - 12*(9*a*d^2*e*r^5 - 4*b*d^2*e*n - 3*(3*b*d^2*e*n + 16*a*d^2*e)*r
^4 - 8*a*d^2*e + (30*b*d^2*e*n + 97*a*d^2*e)*r^3 - (37*b*d^2*e*n + 94*a*d^2
*e)*r^2 + 4*(5*b*d^2*e*n + 11*a*d^2*e)*r + (9*b*d^2*e*r^5 - 48*b*d^2*e*r^4
+ 97*b*d^2*e*r^3 - 94*b*d^2*e*r^2 + 44*b*d^2*e*r - 8*b*d^2*e)*log(c) + (9*b
*d^2*e*n*r^5 - 48*b*d^2*e*n*r^4 + 97*b*d^2*e*n*r^3 - 94*b*d^2*e*n*r^2 + 44*
b*d^2*e*n*r - 8*b*d^2*e*n)*log(x))*x^r + 2*(9*b*d^3*r^6 - 66*b*d^3*r^5 + 19
3*b*d^3*r^4 - 288*b*d^3*r^3 + 232*b*d^3*r^2 - 96*b*d^3*r + 16*b*d^3)*log(c)
 + 2*(9*b*d^3*n*r^6 - 66*b*d^3*n*r^5 + 193*b*d^3*n*r^4 - 288*b*d^3*n*r^3 +
```

232*b*d^3*n*r^2 - 96*b*d^3*n*r + 16*b*d^3*n)*log(x))/((9*r^6 - 66*r^5 + 193*r^4 - 288*r^3 + 232*r^2 - 96*r + 16)*x^2)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r + d)^3 \left(b \log (cx^n) + a\right)}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^3, x)
```

maple [C] time = 0.49, size = 4027, normalized size = 21.08

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(b*ln(c*x^n)+a)/x^3,x)
```

```
[Out] -1/2*b*(-2*e^3*r^2*(x^r)^3-9*d*e^2*r^2*(x^r)^2+6*e^3*r*(x^r)^3+3*d^3*r^3-18*d^2*e*r^2*x^r+24*d*e^2*r*(x^r)^2-4*e^3*(x^r)^3-11*d^3*r^2+30*d^2*e*r*x^r-12*d*e^2*(x^r)^2+12*d^3*r-12*d^2*e*x^r-4*d^3)/x^2/(-2+3*r)/(r-1)/(r-2)*ln(x^n)-1/4*(-132*a*d^3*r^5+386*a*d^3*r^4+9*b*d^3*n*r^6-66*b*d^3*n*r^5+193*b*d^3*n*r^4+32*a*e^3*(x^r)^3+32*a*d^3-102*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-102*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-6*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+18*ln(c)*b*d^3*r^6-132*ln(c)*b*d^3*r^5+386*ln(c)*b*d^3*r^4-576*ln(c)*b*d^3*r^3+464*ln(c)*b*d^3*r^2-192*ln(c)*b*d^3*r+18*a*d^3*r^6+16*b*d^3*n-12*a*e^3*r^5*(x^r)^3+80*a*e^3*r^4*(x^r)^3+32*ln(c)*b*e^3*(x^r)^3+16*b*e^3*n*(x^r)^3-204*a*e^3*r^3*(x^r)^3+248*a*e^3*r^2*(x^r)^3-144*a*e^3*r*(x^r)^3+96*a*d*e^2*(x^r)^2+96*a*d^2*e*x^r+32*b*d^3*ln(c)-288*b*d^3*n*r^3+232*b*d^3*n*r^2-96*b*d^3*n*r-16*I*Pi*b*d^3*csgn(I*c*x^n)^3-564*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-576*a*d^3*r^3+464*a*d^3*r^2-192*a*d^3*r-480*ln(c)*b*d*e^2*r*(x^r)^2-1164*ln(c)*b*d^2*e*r^3*x^r+1128*ln(c)*b*d^2*e*r^2*x^r-528*ln(c)*b*d^2*e*r*x^r-816*ln(c)*b*d*e^2*r^3*(x^r)^2+912*ln(c)*b*d*e^2*r^2*(x^r)^2-240*b*d^2*e*n*r*x^r+264*b*d*e^2*n*r^2*(x^r)^2+444*b*d^2*e*n*r^2*x^r-240*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+240*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-240*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-264*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-264*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+48*b*d^2*e*n*x^r-816*a*d*e^2*r^3*(x^r)^2+912*a*d*e^2*r^2*(x^r)^2-480*a*d*e^2*r*(x^r)^2-1164*a*d^2*e*r^3*x^r+1128*a*d^2*e*r^2*x^r-54*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+288*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-456*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-564*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r+40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+48*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+102*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+6*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3+582*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r-72*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-456*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+48*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+48*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+48*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+124*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-66*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)-288*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-288*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)+264*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-288*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+456*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+456*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
```

```
I*c)*(x^r)^3+171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-48*I*
Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+288*I*Pi*b*d^2*e*r^4
*csgn(I*c*x^n)^2*csgn(I*c)*x^r-124*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*(x^r)^3+124*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-24*
b*e^3*n*r^3*(x^r)^3-54*a*d*e^2*r^5*(x^r)^2+342*a*d*e^2*r^4*(x^r)^2-108*a*d^
2*e*r^5*x^r+576*a*d^2*e*r^4*x^r+52*b*e^3*n*r^2*(x^r)^3-48*b*e^3*n*r*(x^r)^3
+48*b*d*e^2*n*(x^r)^2+4*b*e^3*n*r^4*(x^r)^3-528*a*d^2*e*r*x^r+96*ln(c)*b*d^
2*e*x^r+96*ln(c)*b*d*e^2*(x^r)^2-12*ln(c)*b*e^3*r^5*(x^r)^3+80*ln(c)*b*e^3*
r^4*(x^r)^3-204*ln(c)*b*e^3*r^3*(x^r)^3+248*ln(c)*b*e^3*r^2*(x^r)^3-144*ln(
c)*b*e^3*r*(x^r)^3+66*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-72
*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+240*I*Pi*b*d*e^2*r*csgn(I*c
*x^n)^3*(x^r)^2-96*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2-96*I*Pi*b*d^3*r
*csgn(I*c*x^n)^2*csgn(I*c)-66*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2-48
*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2+16*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^
n)^2*(x^r)^3-124*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3-48*I*Pi*b*d^2*e*csg
n(I*c*x^n)^3*x^r+6*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)
^3+9*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-27*I*Pi*b*d*e^2*r^5*csgn(I*x^
n)*csgn(I*c*x^n)^2*(x^r)^2-232*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3-16*I*Pi*b*e^3
*csgn(I*c*x^n)^3*(x^r)^3+16*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+16*I*Pi*
b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-9*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3-193*I*Pi*b
*d^3*r^4*csgn(I*c*x^n)^3+27*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2-9*I*Pi
*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-193*I*Pi*b*d^3*r^4*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2-16*
I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-582*I*Pi*b*d^2*e*r^3
*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-582*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(
I*c)*x^r+72*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-40*I*P
i*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3+193*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c
*x^n)^2+193*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)+16*I*Pi*b*e^3*csgn(I*c
*x^n)^2*csgn(I*c)*(x^r)^3+40*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)
^3-232*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+232*I*Pi*b*d^3*r^
2*csgn(I*x^n)*csgn(I*c*x^n)^2-16*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+9*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2+232*I*Pi*b*d^3*r^2*csgn(I
*c*x^n)^2*csgn(I*c)-27*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+9
6*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-192*b*d*e^2*n*r*(x^r)^2-
54*ln(c)*b*d*e^2*r^5*(x^r)^2+342*ln(c)*b*d*e^2*r^4*(x^r)^2-108*ln(c)*b*d^2*
e*r^5*x^r+576*ln(c)*b*d^2*e*r^4*x^r+27*b*d*e^2*n*r^4*(x^r)^2-144*b*d*e^2*n*
r^3*(x^r)^2+108*b*d^2*e*n*r^4*x^r-360*b*d^2*e*n*r^3*x^r+264*I*Pi*b*d^2*e*r*
csgn(I*c*x^n)^3*x^r+288*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3+96*I*Pi*b*d^3*r*csgn
(I*c*x^n)^3+408*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-54*I*Pi*b*d^2*e*r^
5*csgn(I*c*x^n)^2*csgn(I*c)*x^r-408*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x
^n)^2*(x^r)^2-408*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+171*I*
Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+288*I*Pi*b*d^2*e*r^4*csgn(
I*x^n)*csgn(I*c*x^n)^2*x^r-48*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*x^r+564*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+54*I*Pi*b*d^2*e*
r^5*csgn(I*c*x^n)^3*x^r+27*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*(x^r)^2+54*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+66
*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3+408*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)*(x^r)^2+582*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*x^r-6*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+72*I*Pi*b*e^3*r*
csgn(I*c*x^n)^3*(x^r)^3+102*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+564*I*Pi
*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r)/(-2+3*r)^2/x^2/(r-1)^2/(r-2)^
2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-3>0)', see `assume?` for more det
ails)Is r-3 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d + e\,x^r)^3\,(a + b\,\ln(c\,x^n))}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^3,x)
```

```
[Out] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^3, x)
```

sympy [A] time = 141.14, size = 350, normalized size = 1.83

$$-\frac{ad^3}{2x^2}+3ad^2e\left(\begin{cases}\frac{x^r}{rx^2-2x^2} & \text{for } r \neq 2\\ \log(x) & \text{otherwise}\end{cases}\right)+3ade^2\left(\begin{cases}\frac{x^{2r}}{2rx^2-2x^2} & \text{for } r \neq 1\\ \log(x) & \text{otherwise}\end{cases}\right)+ae^3\left(\begin{cases}\frac{x^{3r}}{3rx^2-2x^2} & \text{for } r \neq \frac{2}{3}\\ \log(x) & \text{otherwise}\end{cases}\right)-\frac{bd^3n}{4x^2}-\frac{b\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] -a*d**3/(2*x**2) + 3*a*d**2*e*Piecewise((x**r/(r*x**2 - 2*x**2), Ne(r, 2)),
 (log(x), True)) + 3*a*d*e**2*Piecewise((x**(2*r)/(2*r*x**2 - 2*x**2), Ne(r
, 1)), (log(x), True)) + a*e**3*Piecewise((x**(3*r)/(3*r*x**2 - 2*x**2), Ne
(r, 2/3)), (log(x), True)) - b*d**3*n/(4*x**2) - b*d**3*log(c*x**n)/(2*x**2
) - 3*b*d**2*e*n*Piecewise((Piecewise((x**r/(r*x**2 - 2*x**2), Ne(r, 2)), (
log(x), True))/(r - 2), (r > -oo) & (r < oo) & Ne(r, 2)), (log(x)**2/2, Tru
e)) + 3*b*d**2*e*Piecewise((x**(r - 2)/(r - 2), Ne(r - 3, -1)), (log(x), Tr
ue))*log(c*x**n) - 3*b*d*e**2*n*Piecewise((Piecewise((x**(2*r)/(2*r*x**2 -
2*x**2), Ne(r, 1)), (log(x), True))/(2*r - 2), (r > -oo) & (r < oo) & Ne(r,
 1)), (log(x)**2/2, True)) + 3*b*d*e**2*Piecewise((x**(2*r - 2)/(2*r - 2),
Ne(2*r - 3, -1)), (log(x), True))*log(c*x**n) - b*e**3*n*Piecewise((Piecewi
se((x**(3*r)/(3*r*x**2 - 2*x**2), Ne(r, 2/3)), (log(x), True))/(3*r - 2), (
r > -oo) & (r < oo) & Ne(r, 2/3)), (log(x)**2/2, True)) + b*e**3*Piecewise(
(x**(3*r - 2)/(3*r - 2), Ne(3*r - 3, -1)), (log(x), True))*log(c*x**n)
```

3.397 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=191

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{3d^2ex^{r-4}\left(a+b\log\left(cx^n\right)\right)}{4-r}-\frac{3de^2x^{-2(2-r)}\left(a+b\log\left(cx^n\right)\right)}{2(2-r)}-\frac{e^3x^{3r-4}\left(a+b\log\left(cx^n\right)\right)}{4-3r}-\frac{bd^3n}{16x^4}-$$

```
[Out] -1/16*b*d^3*n/x^4-3/4*b*d*e^2*n/(2-r)^2/(x^(4-2*r))-3*b*d^2*e*n*x^(-4+r)/(4
-r)^2-b*e^3*n*x^(-4+3*r)/(4-3*r)^2-1/4*d^3*(a+b*ln(c*x^n))/x^4-3/2*d*e^2*(a
+b*ln(c*x^n))/(2-r)/(x^(4-2*r))-3*d^2*e*x^(-4+r)*(a+b*ln(c*x^n))/(4-r)-e^3*
x^(-4+3*r)*(a+b*ln(c*x^n))/(4-3*r)
```

Rubi [A] time = 0.40, antiderivative size = 161, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{4}\left(\frac{12d^2ex^{r-4}}{4-r}+\frac{d^3}{x^4}+\frac{6de^2x^{-2(2-r)}}{2-r}+\frac{4e^3x^{3r-4}}{4-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r-4}}{(4-r)^2}-\frac{bd^3n}{16x^4}-\frac{3bde^2nx^{-2(2-r)}}{4(2-r)^2}-\frac{be^3nx^{3r-4}}{(4-3r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d^3*n)/(16*x^4) - (3*b*d*e^2*n)/(4*(2 - r)^2*x^(2*(2 - r))) - (3*b*d^2*
e*n*x^(-4 + r))/(4 - r)^2 - (b*e^3*n*x^(-4 + 3*r))/(4 - 3*r)^2 - ((d^3/x^4
+ (6*d*e^2)/((2 - r)*x^(2*(2 - r))) + (12*d^2*e*x^(-4 + r))/(4 - r) + (4*e^
3*x^(-4 + 3*r))/(4 - 3*r))*(a + b*Log[c*x^n]))/4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^3\left(a+b\log\left(cx^n\right)\right)}{x^5}\,dx = -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6de^2x^{-2(2-r)}}{2-r}+\frac{12d^2ex^{-4+r}}{4-r}+\frac{4e^3x^{-4+3r}}{4-3r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn$$

$$= -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6de^2x^{-2(2-r)}}{2-r}+\frac{12d^2ex^{-4+r}}{4-r}+\frac{4e^3x^{-4+3r}}{4-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(b$$

$$= -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6de^2x^{-2(2-r)}}{2-r}+\frac{12d^2ex^{-4+r}}{4-r}+\frac{4e^3x^{-4+3r}}{4-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}(b$$

$$= -\frac{bd^3n}{16x^4}-\frac{3bde^2nx^{-2(2-r)}}{4(2-r)^2}-\frac{3bd^2enx^{-4+r}}{(4-r)^2}-\frac{be^3nx^{-4+3r}}{(4-3r)^2}-\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6de^2x^{-2(2}}{2-r}\right.$$

Mathematica [A] time = 0.41, size = 181, normalized size = 0.95

$$\frac{a\left(-4d^3+\frac{48d^2ex^r}{r-4}+\frac{24de^2x^{2r}}{r-2}+\frac{16e^3x^{3r}}{3r-4}\right)+4b\log\left(cx^n\right)\left(-d^3+\frac{12d^2ex^r}{r-4}+\frac{6de^2x^{2r}}{r-2}+\frac{4e^3x^{3r}}{3r-4}\right)+bn\left(-d^3-\frac{48d^2ex^r}{(r-4)^2}-\frac{12de}{(r-2}\right.}{16x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] (b*n*(-d^3 - (48*d^2*e*x^r)/(-4 + r)^2 - (12*d*e^2*x^(2*r))/(-2 + r)^2 - (1
6*e^3*x^(3*r))/(4 - 3*r)^2) + a*(-4*d^3 + (48*d^2*e*x^r)/(-4 + r) + (24*d*e
^2*x^(2*r))/(-2 + r) + (16*e^3*x^(3*r))/(-4 + 3*r)) + 4*b*(-d^3 + (12*d^2*e
*x^r)/(-4 + r) + (6*d*e^2*x^(2*r))/(-2 + r) + (4*e^3*x^(3*r))/(-4 + 3*r))*L
og[c*x^n])/(16*x^4)
```

fricas [B] time = 0.51, size = 980, normalized size = 5.13

$$-\frac{9\left(bd^3n+4\,ad^3\right)r^6-132\left(bd^3n+4\,ad^3\right)r^5+1024\,bd^3n+772\left(bd^3n+4\,ad^3\right)r^4+4096\,ad^3-2304\left(bd^3n+4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] -1/16*(9*(b*d^3*n + 4*a*d^3)*r^6 - 132*(b*d^3*n + 4*a*d^3)*r^5 + 1024*b*d^3
*n + 772*(b*d^3*n + 4*a*d^3)*r^4 + 4096*a*d^3 - 2304*(b*d^3*n + 4*a*d^3)*r^
3 + 3712*(b*d^3*n + 4*a*d^3)*r^2 - 3072*(b*d^3*n + 4*a*d^3)*r - 16*(3*a*e^3
*r^5 - 64*b*e^3*n - (b*e^3*n + 40*a*e^3)*r^4 - 256*a*e^3 + 12*(b*e^3*n + 17
*a*e^3)*r^3 - 4*(13*b*e^3*n + 124*a*e^3)*r^2 + 96*(b*e^3*n + 6*a*e^3)*r + (
3*b*e^3*r^5 - 40*b*e^3*r^4 + 204*b*e^3*r^3 - 496*b*e^3*r^2 + 576*b*e^3*r -
256*b*e^3)*log(c) + (3*b*e^3*n*r^5 - 40*b*e^3*n*r^4 + 204*b*e^3*n*r^3 - 496
*b*e^3*n*r^2 + 576*b*e^3*n*r - 256*b*e^3*n)*log(x))*x^(3*r) - 12*(18*a*d*e^
2*r^5 - 256*b*d*e^2*n - 3*(3*b*d*e^2*n + 76*a*d*e^2)*r^4 - 1024*a*d*e^2 + 3
2*(3*b*d*e^2*n + 34*a*d*e^2)*r^3 - 32*(11*b*d*e^2*n + 76*a*d*e^2)*r^2 + 512
*(b*d*e^2*n + 5*a*d*e^2)*r + 2*(9*b*d*e^2*r^5 - 114*b*d*e^2*r^4 + 544*b*d*e
^2*r^3 - 1216*b*d*e^2*r^2 + 1280*b*d*e^2*r - 512*b*d*e^2)*log(c) + 2*(9*b*d
*e^2*n*r^5 - 114*b*d*e^2*n*r^4 + 544*b*d*e^2*n*r^3 - 1216*b*d*e^2*n*r^2 + 1
280*b*d*e^2*n*r - 512*b*d*e^2*n)*log(x))*x^(2*r) - 48*(9*a*d^2*e*r^5 - 64*b
*d^2*e*n - 3*(3*b*d^2*e*n + 32*a*d^2*e)*r^4 - 256*a*d^2*e + 4*(15*b*d^2*e*n
 + 97*a*d^2*e)*r^3 - 4*(37*b*d^2*e*n + 188*a*d^2*e)*r^2 + 32*(5*b*d^2*e*n +
 22*a*d^2*e)*r + (9*b*d^2*e*r^5 - 96*b*d^2*e*r^4 + 388*b*d^2*e*r^3 - 752*b*
d^2*e*r^2 + 704*b*d^2*e*r - 256*b*d^2*e)*log(c) + (9*b*d^2*e*n*r^5 - 96*b*d
^2*e*n*r^4 + 388*b*d^2*e*n*r^3 - 752*b*d^2*e*n*r^2 + 704*b*d^2*e*n*r - 256*
b*d^2*e*n)*log(x))*x^r + 4*(9*b*d^3*r^6 - 132*b*d^3*r^5 + 772*b*d^3*r^4 - 2
304*b*d^3*r^3 + 3712*b*d^3*r^2 - 3072*b*d^3*r + 1024*b*d^3)*log(c) + 4*(9*b
```

```
*d^3*n*r^6 - 132*b*d^3*n*r^5 + 772*b*d^3*n*r^4 - 2304*b*d^3*n*r^3 + 3712*b*
d^3*n*r^2 - 3072*b*d^3*n*r + 1024*b*d^3*n)*log(x))/((9*r^6 - 132*r^5 + 772*
r^4 - 2304*r^3 + 3712*r^2 - 3072*r + 1024)*x^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r+d)^3\left(b\log\left(cx^n\right)+a\right)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^5, x)
```

maple [C] time = 0.49, size = 4027, normalized size = 21.08

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(b*ln(c*x^n)+a)/x^5,x)
```

```
[Out] -1/4*b*(-4*e^3*r^2*(x^r)^3-18*d*e^2*r^2*(x^r)^2+24*e^3*r*(x^r)^3+3*d^3*r^3-
36*d^2*e*r^2*x^r+96*d*e^2*r*(x^r)^2-32*e^3*(x^r)^3-22*d^3*r^2+120*d^2*e*r*x
^r-96*d*e^2*(x^r)^2+48*d^3*r-96*d^2*e*x^r-32*d^3)/x^4/(-4+3*r)/(r-2)/(r-4)*
ln(x^n)-1/16*(-14592*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-528*a*d^3*r^5
+3088*a*d^3*r^4+216*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^
r-18048*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+1368*I*Pi*
b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1368*I*Pi*b*d*e^2*r^4*csgn(
I*c*x^n)^2*csgn(I*c)*(x^r)^2+2304*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n
)^2*x^r-6144*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+9*b*d^3*n
*r^6-132*b*d^3*n*r^5+772*b*d^3*n*r^4+4096*a*e^3*(x^r)^3+4096*a*d^3+15360*I*
Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+6528*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*
(x^r)^2-6528*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-6528*I*Pi
*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+36*ln(c)*b*d^3*r^6-528*ln(c)
*b*d^3*r^5+3088*ln(c)*b*d^3*r^4-9216*ln(c)*b*d^3*r^3+14848*ln(c)*b*d^3*r^2-
12288*ln(c)*b*d^3*r+36*a*d^3*r^6+1024*b*d^3*n-48*a*e^3*r^5*(x^r)^3+640*a*e^
3*r^4*(x^r)^3+4096*ln(c)*b*e^3*(x^r)^3+1024*b*e^3*n*(x^r)^3-3264*a*e^3*r^3*
(x^r)^3+7936*a*e^3*r^2*(x^r)^3-9216*a*e^3*r*(x^r)^3+12288*a*d*e^2*(x^r)^2+1
2288*a*d^2*e*x^r-6144*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r-320*I*Pi*b*e^3*r^4*c
sgn(I*c*x^n)^3*(x^r)^3+1544*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+1544
*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)+4096*b*d^3*ln(c)-2304*b*d^3*n*r^3
+3712*b*d^3*n*r^2-3072*b*d^3*n*r-9216*a*d^3*r^3+14848*a*d^3*r^2-12288*a*d^3
*r-18*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-30720*ln(c)*b*d*e^
2*r*(x^r)^2-18624*ln(c)*b*d^2*e*r^3*x^r+36096*ln(c)*b*d^2*e*r^2*x^r-33792*l
n(c)*b*d^2*e*r*x^r-13056*ln(c)*b*d*e^2*r^3*(x^r)^2+29184*ln(c)*b*d*e^2*r^2*
(x^r)^2-7680*b*d^2*e*n*r*x^r+4224*b*d*e^2*n*r^2*(x^r)^2+7104*b*d^2*e*n*r^2*
x^r-1368*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2-2048*I*Pi*b*e^3*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+6144*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x
^n)^2*(x^r)^2+6144*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+6144*I*Pi*b
*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2048*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I
*c)-18*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3-216*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn
(I*c*x^n)^2*x^r+18*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2+7424*I*Pi*b*d
^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)+18*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c
)-264*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)+4608*I*Pi*b*e^3*r*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+9312*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*x^r-24*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+26
4*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1632*I*Pi*b*e^3*r^3*cs
gn(I*c*x^n)^3*(x^r)^3+24*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3+3072*b*d^2*
e*n*x^r-13056*a*d*e^2*r^3*(x^r)^2+29184*a*d*e^2*r^2*(x^r)^2-30720*a*d*e^2*r
```

```
*(x^r)^2-18624*a*d^2*e*r^3*x^r+36096*a*d^2*e*r^2*x^r-2048*I*Pi*b*d^3*csgn(I
*c*x^n)^3+16896*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r+15360*I*Pi*b*d*e^2*r*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+16896*I*Pi*b*d^2*e*r*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*x^r+108*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)*(x^r)^2-216*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r-264*I*P
i*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2+4608*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3
+6144*I*Pi*b*d^3*r*csgn(I*c*x^n)^3-1368*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*(x^r)^2-14592*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*(x^r)^2+2304*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r-4608*
I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-2304*I*Pi*b*d^2*e*r^4*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*x^r-15360*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n
)^2*(x^r)^2-108*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-108*I*
Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+264*I*Pi*b*d^3*r^5*csgn(I*
c*x^n)^3-192*b*e^3*n*r^3*(x^r)^3-216*a*d*e^2*r^5*(x^r)^2+2736*a*d*e^2*r^4*(
x^r)^2-432*a*d^2*e*r^5*x^r+4608*a*d^2*e*r^4*x^r+832*b*e^3*n*r^2*(x^r)^3-153
6*b*e^3*n*r*(x^r)^3+3072*b*d*e^2*n*(x^r)^2-9312*I*Pi*b*d^2*e*r^3*csgn(I*x^n
)*csgn(I*c*x^n)^2*x^r-9312*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+1
6*b*e^3*n*r^4*(x^r)^3-33792*a*d^2*e*r*x^r+12288*ln(c)*b*d^2*e*x^r+12288*ln(
c)*b*d*e^2*(x^r)^2-48*ln(c)*b*e^3*r^5*(x^r)^3+640*ln(c)*b*e^3*r^4*(x^r)^3-3
264*ln(c)*b*e^3*r^3*(x^r)^3+7936*ln(c)*b*e^3*r^2*(x^r)^3-9216*ln(c)*b*e^3*r
*(x^r)^3+4608*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4608*I*Pi*
b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)-6144*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*
x^n)^2-6144*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)-16896*I*Pi*b*d^2*e*r*csg
n(I*c*x^n)^2*csgn(I*c)*x^r+216*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r-3968*I*
Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+14592*I*Pi*b*d*e^2
*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+14592*I*Pi*b*d*e^2*r^2*csgn(I*c*x^
n)^2*csgn(I*c)*(x^r)^2+1632*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*(x^r)^3-18048*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r+320*I*Pi*b*e^3*r^4*c
sgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-2304*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^
r+6144*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-6144*b*d*e^2*n*r*(x^r
)^2-216*ln(c)*b*d*e^2*r^5*(x^r)^2+2736*ln(c)*b*d*e^2*r^4*(x^r)^2-432*ln(c)*
b*d^2*e*r^5*x^r+4608*ln(c)*b*d^2*e*r^4*x^r+108*b*d*e^2*n*r^4*(x^r)^2-1152*b
*d*e^2*n*r^3*(x^r)^2+432*b*d^2*e*n*r^4*x^r-2880*b*d^2*e*n*r^3*x^r-1544*I*Pi
*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+18048*I*Pi*b*d^2*e*r^2*csgn(
I*c*x^n)^2*csgn(I*c)*x^r-6144*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*(x^r)^2+108*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2+2048*I*Pi*b*e^3*cs
gn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+7424*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^
n)^2-2048*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+9312*I*Pi*b*d^2*e*
r^3*csgn(I*c*x^n)^3*x^r-4608*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)
^3-4608*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+24*I*Pi*b*e^3*r^5*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-15360*I*Pi*b*d*e^2*r*csgn(I*c*x^n
)^2*csgn(I*c)*(x^r)^2-16896*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+
18048*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-320*I*Pi*b*e^3*r^4*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-1632*I*Pi*b*e^3*r^3*csgn(I*c*x^n
)^2*csgn(I*c)*(x^r)^3-1632*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)
^3-24*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+3968*I*Pi*b*e^3*r^
2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+320*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*cs
gn(I*c)*(x^r)^3-7424*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+396
8*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+6528*I*Pi*b*d*e^2*r^3*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-6144*I*Pi*b*d*e^2*csgn(I*c*x^n)^3
*(x^r)^2+2048*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-3968*I*Pi*b*e^
3*r^2*csgn(I*c*x^n)^3*(x^r)^3-1544*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3-7424*I*Pi
*b*d^3*r^2*csgn(I*c*x^n)^3-2048*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+2048*I*P
i*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+6144*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)+4608*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3)/(-4+3*r)^2/x^4/(r
-2)^2/(r-4)^2
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-5>0)', see `assume?` for more det
ails)Is r-5 equal to -1?
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^r)^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^5,x)
```

```
[Out] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^5, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] Timed out
```

3.398 $\int x^4 (d+ex^r)^3 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=151

$$\frac{1}{5}\left(d^3x^5+\frac{15d^2ex^{r+5}}{r+5}+\frac{15de^2x^{2r+5}}{2r+5}+\frac{5e^3x^{3r+5}}{3r+5}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bd^3nx^5-\frac{3bd^2enx^{r+5}}{(r+5)^2}-\frac{3bde^2nx^{2r+5}}{(2r+5)^2}-\frac{be^3n\ldots}{(3r+\ldots}$$

```
[Out] -1/25*b*d^3*n*x^5-3*b*d^2*e*n*x^(5+r)/(5+r)^2-3*b*d*e^2*n*x^(5+2*r)/(5+2*r)
^2-b*e^3*n*x^(5+3*r)/(5+3*r)^2+1/5*(d^3*x^5+15*d^2*e*x^(5+r)/(5+r)+15*d*e^2
*x^(5+2*r)/(5+2*r)+5*e^3*x^(5+3*r)/(5+3*r))*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.38, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{5}\left(\frac{15d^2ex^{r+5}}{r+5}+d^3x^5+\frac{15de^2x^{2r+5}}{2r+5}+\frac{5e^3x^{3r+5}}{3r+5}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r+5}}{(r+5)^2}-\frac{1}{25}bd^3nx^5-\frac{3bde^2nx^{2r+5}}{(2r+5)^2}-\frac{be^3n\ldots}{(3r+\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^5)/25 - (3*b*d^2*e*n*x^(5 + r))/(5 + r)^2 - (3*b*d*e^2*n*x^(5 +
 2*r))/(5 + 2*r)^2 - (b*e^3*n*x^(5 + 3*r))/(5 + 3*r)^2 + ((d^3*x^5 + (15*d^
2*e*x^(5 + r))/(5 + r) + (15*d*e^2*x^(5 + 2*r))/(5 + 2*r) + (5*e^3*x^(5 + 3
*r))/(5 + 3*r))*(a + b*Log[c*x^n]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^4 (d+ex^r)^3 \left(a+b\log(cx^n)\right) dx = \frac{1}{5}\left(d^3x^5+\frac{15d^2ex^{5+r}}{5+r}+\frac{15de^2x^{5+2r}}{5+2r}+\frac{5e^3x^{5+3r}}{5+3r}\right)\left(a+b\log(cx^n)\right)-(bn)\int$$
$$=\frac{1}{5}\left(d^3x^5+\frac{15d^2ex^{5+r}}{5+r}+\frac{15de^2x^{5+2r}}{5+2r}+\frac{5e^3x^{5+3r}}{5+3r}\right)\left(a+b\log(cx^n)\right)-\frac{1}{5}(bn)$$
$$=\frac{1}{5}\left(d^3x^5+\frac{15d^2ex^{5+r}}{5+r}+\frac{15de^2x^{5+2r}}{5+2r}+\frac{5e^3x^{5+3r}}{5+3r}\right)\left(a+b\log(cx^n)\right)-\frac{1}{5}(bn)$$
$$=-\frac{1}{25}bd^3nx^5-\frac{3bd^2enx^{5+r}}{(5+r)^2}-\frac{3bde^2nx^{5+2r}}{(5+2r)^2}-\frac{be^3nx^{5+3r}}{(5+3r)^2}+\frac{1}{5}\left(d^3x^5+\frac{15d^2ex}{5+}\right.$$

Mathematica [A] time = 0.37, size = 184, normalized size = 1.22

$$\frac{1}{25}x^5\left(5a\left(d^3+\frac{15d^2ex^r}{r+5}+\frac{15de^2x^{2r}}{2r+5}+\frac{5e^3x^{3r}}{3r+5}\right)+5b\log(cx^n)\left(d^3+\frac{15d^2ex^r}{r+5}+\frac{15de^2x^{2r}}{2r+5}+\frac{5e^3x^{3r}}{3r+5}\right)+bn\left(-d^3-\frac{7}{(}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^5*(b*n*(-d^3 - (75*d^2*e*x^r)/(5 + r)^2 - (75*d*e^2*x^(2*r))/(5 + 2*r)^2
 - (25*e^3*x^(3*r))/(5 + 3*r)^2) + 5*a*(d^3 + (15*d^2*e*x^r)/(5 + r) + (15*
d*e^2*x^(2*r))/(5 + 2*r) + (5*e^3*x^(3*r))/(5 + 3*r)) + 5*b*(d^3 + (15*d^2*
e*x^r)/(5 + r) + (15*d*e^2*x^(2*r))/(5 + 2*r) + (5*e^3*x^(3*r))/(5 + 3*r))*
Log[c*x^n]))/25
```

fricas [B] time = 0.50, size = 1023, normalized size = 6.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/25*(5*(36*b*d^3*r^6 + 660*b*d^3*r^5 + 4825*b*d^3*r^4 + 18000*b*d^3*r^3 +
36250*b*d^3*r^2 + 37500*b*d^3*r + 15625*b*d^3)*x^5*log(c) + 5*(36*b*d^3*n*r
^6 + 660*b*d^3*n*r^5 + 4825*b*d^3*n*r^4 + 18000*b*d^3*n*r^3 + 36250*b*d^3*n
*r^2 + 37500*b*d^3*n*r + 15625*b*d^3*n)*x^5*log(x) - (36*(b*d^3*n - 5*a*d^3
)*r^6 + 660*(b*d^3*n - 5*a*d^3)*r^5 + 15625*b*d^3*n + 4825*(b*d^3*n - 5*a*d
^3)*r^4 - 78125*a*d^3 + 18000*(b*d^3*n - 5*a*d^3)*r^3 + 36250*(b*d^3*n - 5*
a*d^3)*r^2 + 37500*(b*d^3*n - 5*a*d^3)*r)*x^5 + 25*((12*b*e^3*r^5 + 200*b*e
^3*r^4 + 1275*b*e^3*r^3 + 3875*b*e^3*r^2 + 5625*b*e^3*r + 3125*b*e^3)*x^5*l
og(c) + (12*b*e^3*n*r^5 + 200*b*e^3*n*r^4 + 1275*b*e^3*n*r^3 + 3875*b*e^3*n
*r^2 + 5625*b*e^3*n*r + 3125*b*e^3*n)*x^5*log(x) + (12*a*e^3*r^5 - 625*b*e^
3*n - 4*(b*e^3*n - 50*a*e^3)*r^4 + 3125*a*e^3 - 15*(4*b*e^3*n - 85*a*e^3)*r
^3 - 25*(13*b*e^3*n - 155*a*e^3)*r^2 - 375*(2*b*e^3*n - 15*a*e^3)*r)*x^5)*x
^(3*r) + 75*((18*b*d*e^2*r^5 + 285*b*d*e^2*r^4 + 1700*b*d*e^2*r^3 + 4750*b*
d*e^2*r^2 + 6250*b*d*e^2*r + 3125*b*d*e^2)*x^5*log(c) + (18*b*d*e^2*n*r^5 +
 285*b*d*e^2*n*r^4 + 1700*b*d*e^2*n*r^3 + 4750*b*d*e^2*n*r^2 + 6250*b*d*e^2
*n*r + 3125*b*d*e^2*n)*x^5*log(x) + (18*a*d*e^2*r^5 - 625*b*d*e^2*n - 3*(3*
b*d*e^2*n - 95*a*d*e^2)*r^4 + 3125*a*d*e^2 - 20*(6*b*d*e^2*n - 85*a*d*e^2)*
r^3 - 50*(11*b*d*e^2*n - 95*a*d*e^2)*r^2 - 250*(4*b*d*e^2*n - 25*a*d*e^2)*r
)*x^5)*x^(2*r) + 75*((36*b*d^2*e*r^5 + 480*b*d^2*e*r^4 + 2425*b*d^2*e*r^3 +
 5875*b*d^2*e*r^2 + 6875*b*d^2*e*r + 3125*b*d^2*e)*x^5*log(c) + (36*b*d^2*e
*n*r^5 + 480*b*d^2*e*n*r^4 + 2425*b*d^2*e*n*r^3 + 5875*b*d^2*e*n*r^2 + 6875
*b*d^2*e*n*r + 3125*b*d^2*e*n)*x^5*log(x) + (36*a*d^2*e*r^5 - 625*b*d^2*e*n
 - 12*(3*b*d^2*e*n - 40*a*d^2*e)*r^4 + 3125*a*d^2*e - 25*(12*b*d^2*e*n - 97
*a*d^2*e)*r^3 - 25*(37*b*d^2*e*n - 235*a*d^2*e)*r^2 - 625*(2*b*d^2*e*n - 11
```

```
*a*d^2*e)*r)*x^5)*x^r)/(36*r^6 + 660*r^5 + 4825*r^4 + 18000*r^3 + 36250*r^2
 + 37500*r + 15625)
```

giac [B] time = 0.60, size = 1588, normalized size = 10.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/25*(180*b*d^3*n*r^6*x^5*log(x) + 2700*b*d^2*n*r^5*x^5*x^r*e*log(x) - 36*b
*d^3*n*r^6*x^5 + 180*b*d^3*r^6*x^5*log(c) + 2700*b*d^2*r^5*x^5*x^r*e*log(c)
 + 3300*b*d^3*n*r^5*x^5*log(x) + 1350*b*d*n*r^5*x^5*x^(2*r)*e^2*log(x) + 36
000*b*d^2*n*r^4*x^5*x^r*e*log(x) - 660*b*d^3*n*r^5*x^5 + 180*a*d^3*r^6*x^5
- 2700*b*d^2*n*r^4*x^5*x^r*e + 2700*a*d^2*r^5*x^5*x^r*e + 3300*b*d^3*r^5*x^
5*log(c) + 1350*b*d*r^5*x^5*x^(2*r)*e^2*log(c) + 36000*b*d^2*r^4*x^5*x^r*e*
log(c) + 24125*b*d^3*n*r^4*x^5*log(x) + 300*b*n*r^5*x^5*x^(3*r)*e^3*log(x)
+ 21375*b*d*n*r^4*x^5*x^(2*r)*e^2*log(x) + 181875*b*d^2*n*r^3*x^5*x^r*e*log
(x) - 4825*b*d^3*n*r^4*x^5 + 3300*a*d^3*r^5*x^5 - 675*b*d*n*r^4*x^5*x^(2*r)
*e^2 + 1350*a*d*r^5*x^5*x^(2*r)*e^2 - 22500*b*d^2*n*r^3*x^5*x^r*e + 36000*a
*d^2*r^4*x^5*x^r*e + 24125*b*d^3*r^4*x^5*log(c) + 300*b*r^5*x^5*x^(3*r)*e^3
*log(c) + 21375*b*d*r^4*x^5*x^(2*r)*e^2*log(c) + 181875*b*d^2*r^3*x^5*x^r*e
*log(c) + 90000*b*d^3*n*r^3*x^5*log(x) + 5000*b*n*r^4*x^5*x^(3*r)*e^3*log(x
) + 127500*b*d*n*r^3*x^5*x^(2*r)*e^2*log(x) + 440625*b*d^2*n*r^2*x^5*x^r*e*
log(x) - 18000*b*d^3*n*r^3*x^5 + 24125*a*d^3*r^4*x^5 - 100*b*n*r^4*x^5*x^(3
*r)*e^3 + 300*a*r^5*x^5*x^(3*r)*e^3 - 9000*b*d*n*r^3*x^5*x^(2*r)*e^2 + 2137
5*a*d*r^4*x^5*x^(2*r)*e^2 - 69375*b*d^2*n*r^2*x^5*x^r*e + 181875*a*d^2*r^3*
x^5*x^r*e + 90000*b*d^3*r^3*x^5*log(c) + 5000*b*r^4*x^5*x^(3*r)*e^3*log(c)
+ 127500*b*d*r^3*x^5*x^(2*r)*e^2*log(c) + 440625*b*d^2*r^2*x^5*x^r*e*log(c)
 + 181250*b*d^3*n*r^2*x^5*log(x) + 31875*b*n*r^3*x^5*x^(3*r)*e^3*log(x) + 3
56250*b*d*n*r^2*x^5*x^(2*r)*e^2*log(x) + 515625*b*d^2*n*r*x^5*x^r*e*log(x)
- 36250*b*d^3*n*r^2*x^5 + 90000*a*d^3*r^3*x^5 - 1500*b*n*r^3*x^5*x^(3*r)*e^
3 + 5000*a*r^4*x^5*x^(3*r)*e^3 - 41250*b*d*n*r^2*x^5*x^(2*r)*e^2 + 127500*a
*d*r^3*x^5*x^(2*r)*e^2 - 93750*b*d^2*n*r*x^5*x^r*e + 440625*a*d^2*r^2*x^5*x
^r*e + 181250*b*d^3*r^2*x^5*log(c) + 31875*b*r^3*x^5*x^(3*r)*e^3*log(c) + 3
56250*b*d*r^2*x^5*x^(2*r)*e^2*log(c) + 515625*b*d^2*r*x^5*x^r*e*log(c) + 18
7500*b*d^3*n*r*x^5*log(x) + 96875*b*n*r^2*x^5*x^(3*r)*e^3*log(x) + 468750*b
*d*n*r*x^5*x^(2*r)*e^2*log(x) + 234375*b*d^2*n*x^5*x^r*e*log(x) - 37500*b*d
^3*n*r*x^5 + 181250*a*d^3*r^2*x^5 - 8125*b*n*r^2*x^5*x^(3*r)*e^3 + 31875*a*
r^3*x^5*x^(3*r)*e^3 - 75000*b*d*n*r*x^5*x^(2*r)*e^2 + 356250*a*d*r^2*x^5*x^
(2*r)*e^2 - 46875*b*d^2*n*x^5*x^r*e + 515625*a*d^2*r*x^5*x^r*e + 187500*b*d
^3*r*x^5*log(c) + 96875*b*r^2*x^5*x^(3*r)*e^3*log(c) + 468750*b*d*r*x^5*x^(
2*r)*e^2*log(c) + 234375*b*d^2*x^5*x^r*e*log(c) + 78125*b*d^3*n*x^5*log(x)
+ 140625*b*n*r*x^5*x^(3*r)*e^3*log(x) + 234375*b*d*n*x^5*x^(2*r)*e^2*log(x)
 - 15625*b*d^3*n*x^5 + 187500*a*d^3*r*x^5 - 18750*b*n*r*x^5*x^(3*r)*e^3 + 9
6875*a*r^2*x^5*x^(3*r)*e^3 - 46875*b*d*n*x^5*x^(2*r)*e^2 + 468750*a*d*r*x^5
*x^(2*r)*e^2 + 234375*a*d^2*x^5*x^r*e + 78125*b*d^3*x^5*log(c) + 140625*b*r
*x^5*x^(3*r)*e^3*log(c) + 234375*b*d*x^5*x^(2*r)*e^2*log(c) + 78125*b*n*x^5
*x^(3*r)*e^3*log(x) + 78125*a*d^3*x^5 - 15625*b*n*x^5*x^(3*r)*e^3 + 140625*
a*r*x^5*x^(3*r)*e^3 + 234375*a*d*x^5*x^(2*r)*e^2 + 78125*b*x^5*x^(3*r)*e^3*
log(c) + 78125*a*x^5*x^(3*r)*e^3)/(36*r^6 + 660*r^5 + 4825*r^4 + 18000*r^3
+ 36250*r^2 + 37500*r + 15625)
```

maple [C] time = 0.51, size = 4031, normalized size = 26.70

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d+e*x^r)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/5*x^5*b*(10*e^3*r^2*(x^r)^3+45*d*e^2*r^2*(x^r)^2+75*e^3*r*(x^r)^3+6*d^3*r
^3+90*d^2*e*r^2*x^r+300*d*e^2*r*(x^r)^2+125*e^3*(x^r)^3+55*d^3*r^2+375*d^2*
e*r*x^r+375*d*e^2*(x^r)^2+150*d^3*r+375*d^2*e*x^r+125*d^3)/(5+3*r)/(2*r+5)/
(r+5)*ln(x^n)-1/50*x^5*(-6600*a*d^3*r^5-48250*a*d^3*r^4+36000*I*Pi*b*d^2*e*
r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+3300*I*Pi*b*d^3*r^5*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)-181875*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^
2*x^r+140625*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-44062
5*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+72*b*d^3*n*r^6+1320*b*d^
3*n*r^5+9650*b*d^3*n*r^4-156250*a*e^3*(x^r)^3-156250*a*d^3-360*ln(c)*b*d^3*
r^6-6600*ln(c)*b*d^3*r^5-48250*ln(c)*b*d^3*r^4-180000*ln(c)*b*d^3*r^3-36250
0*ln(c)*b*d^3*r^2-375000*ln(c)*b*d^3*r+24125*I*Pi*b*d^3*r^4*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)+21375*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2+78125*I
*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-234375*I*Pi*b*d*e^2*c
sgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-360*a*d^3*r^6+31250*b*d^3*n-600*a*e^3*r^
5*(x^r)^3-10000*a*e^3*r^4*(x^r)^3-156250*ln(c)*b*e^3*(x^r)^3+31250*b*e^3*n*
(x^r)^3-63750*a*e^3*r^3*(x^r)^3-193750*a*e^3*r^2*(x^r)^3-281250*a*e^3*r*(x^
r)^3-468750*a*d*e^2*(x^r)^2-468750*a*d^2*e*x^r-187500*I*Pi*b*d^3*r*csgn(I*c
*x^n)^2*csgn(I*c)-156250*b*d^3*ln(c)+36000*b*d^3*n*r^3+72500*b*d^3*n*r^2+75
000*b*d^3*n*r+2700*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r
+21375*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+1350*I*
Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-180000*a*d^3*r^3
-362500*a*d^3*r^2-375000*a*d^3*r-937500*ln(c)*b*d*e^2*r*(x^r)^2-363750*ln(c
)*b*d^2*e*r^3*x^r-881250*ln(c)*b*d^2*e*r^2*x^r-1031250*ln(c)*b*d^2*e*r*x^r-
255000*ln(c)*b*d*e^2*r^3*(x^r)^2-712500*ln(c)*b*d*e^2*r^2*(x^r)^2+187500*b*
d^2*e*n*r*x^r+82500*b*d*e^2*n*r^2*(x^r)^2+138750*b*d^2*e*n*r^2*x^r+187500*I
*Pi*b*d^3*r*csgn(I*c*x^n)^3+78125*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3-78125*
I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-78125*I*Pi*b*d^3*csgn(I*c*x^n)^2*csg
n(I*c)+180*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+3300*I*Pi*b*d^3*r^5*csgn(I*c*x^n)
^3+24125*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3+90000*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^
3-180*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2-90000*I*Pi*b*d^3*r^3*csgn(
I*c*x^n)^2*csgn(I*c)-181250*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)-440625
*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-468750*I*Pi*b*d*e^2*r*csgn(
I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-1350*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x
^n)^2*(x^r)^2+234375*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)
^2+78125*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+440625*I*Pi*b*d^2*e
*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+93750*b*d^2*e*n*x^r-255000*a*d
*e^2*r^3*(x^r)^2-712500*a*d*e^2*r^2*(x^r)^2-937500*a*d*e^2*r*(x^r)^2-363750
*a*d^2*e*r^3*x^r-881250*a*d^2*e*r^2*x^r-36000*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n
)^2*csgn(I*c)*x^r+96875*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
(x^r)^3-181875*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-21375*I*Pi*b*
d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-36000*I*Pi*b*d^2*e*r^4*csgn(I*x
^n)*csgn(I*c*x^n)^2*x^r+300*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*(x^r)^3-468750*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+468750*
I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+356250*I*Pi*b*d*
e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-515625*I*Pi*b*d^2*e*r*c
sgn(I*x^n)*csgn(I*c*x^n)^2*x^r-515625*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I
*c)*x^r+234375*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-1350*I*
Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+356250*I*Pi*b*d*e^2*r^2*cs
gn(I*c*x^n)^3*(x^r)^2-140625*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)
^3-140625*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+440625*I*Pi*b*d^2*
e*r^2*csgn(I*c*x^n)^3*x^r+78125*I*Pi*b*d^3*csgn(I*c*x^n)^3+3000*b*e^3*n*r^3
*(x^r)^3-2700*a*d*e^2*r^5*(x^r)^2-42750*a*d*e^2*r^4*(x^r)^2-5400*a*d^2*e*r^
5*x^r-72000*a*d^2*e*r^4*x^r+16250*b*e^3*n*r^2*(x^r)^3+37500*b*e^3*n*r*(x^r)
^3+93750*b*d*e^2*n*(x^r)^2+200*b*e^3*n*r^4*(x^r)^3-1031250*a*d^2*e*r*x^r-46
8750*ln(c)*b*d^2*e*x^r-468750*ln(c)*b*d*e^2*(x^r)^2-600*ln(c)*b*e^3*r^5*(x^
r)^3-10000*ln(c)*b*e^3*r^4*(x^r)^3-63750*ln(c)*b*e^3*r^3*(x^r)^3-193750*ln(
c)*b*e^3*r^2*(x^r)^3-281250*ln(c)*b*e^3*r*(x^r)^3-78125*I*Pi*b*e^3*csgn(I*x
^n)*csgn(I*c*x^n)^2*(x^r)^3+140625*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3-180
*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-3300*I*Pi*b*d^3*r^5*csgn(I*x^n)*c
```

```
sgn(I*c*x^n)^2+234375*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2+181875*I*Pi*b*d^
2*e*r^3*csgn(I*c*x^n)^3*x^r-356250*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^
n)^2*(x^r)^2-356250*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-5000
*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+181250*I*Pi*b*d^3*r^2*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+90000*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)-96875*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+18125
0*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3+96875*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)
^3+31875*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+234375*I*Pi*b*d^2*e*csgn(I*
c*x^n)^3*x^r+300*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3+5000*I*Pi*b*e^3*r^4
*csgn(I*c*x^n)^3*(x^r)^3-3300*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)+1500
00*b*d*e^2*n*r*(x^r)^2-2700*ln(c)*b*d*e^2*r^5*(x^r)^2-42750*ln(c)*b*d*e^2*r
^4*(x^r)^2-5400*ln(c)*b*d^2*e*r^5*x^r-72000*ln(c)*b*d^2*e*r^4*x^r+1350*b*d*
e^2*n*r^4*(x^r)^2+18000*b*d*e^2*n*r^3*(x^r)^2+5400*b*d^2*e*n*r^4*x^r+45000*
b*d^2*e*n*r^3*x^r+5000*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(
x^r)^3-2700*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-2700*I*Pi*b*d^
2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r-21375*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*cs
gn(I*c*x^n)^2*(x^r)^2+1350*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2-5000*I*
Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+2700*I*Pi*b*d^2*e*r^5*csgn
(I*c*x^n)^3*x^r+36000*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r-24125*I*Pi*b*d^3
*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-24125*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(
I*c)-78125*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+181875*I*Pi*b*d^2*e
*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+127500*I*Pi*b*d*e^2*r^3*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+515625*I*Pi*b*d^2*e*r*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*x^r+31875*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*(x^r)^3-127500*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-
127500*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-234375*I*Pi*b*d^2
*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-234375*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn
(I*c)*x^r-96875*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-31875*I*
Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-31875*I*Pi*b*e^3*r^3*csgn(
I*c*x^n)^2*csgn(I*c)*(x^r)^3-181250*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n
)^2-90000*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-187500*I*Pi*b*d^3*r*cs
gn(I*x^n)*csgn(I*c*x^n)^2+468750*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+127
500*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-300*I*Pi*b*e^3*r^5*csgn(I*x^n)
*csgn(I*c*x^n)^2*(x^r)^3-300*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)
^3+515625*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r-234375*I*Pi*b*d*e^2*csgn(I*c*x
^n)^2*csgn(I*c)*(x^r)^2+187500*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+180*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c))/(5+3*r)^2/(2*r
+5)^2/(r+5)^2
```

maxima [A] time = 1.38, size = 228, normalized size = 1.51

$$-\frac{1}{25}\,bd^3nx^5+\frac{1}{5}\,bd^3x^5\log\left(cx^n\right)+\frac{1}{5}\,ad^3x^5+\frac{be^3x^{3\,r+5}\log\left(cx^n\right)}{3\,r+5}+\frac{3\,bde^2x^{2\,r+5}\log\left(cx^n\right)}{2\,r+5}+\frac{3\,bd^2ex^{r+5}\log\left(cx^n\right)}{r+5}-\frac{be^3}{(3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/25*b*d^3*n*x^5 + 1/5*b*d^3*x^5*log(c*x^n) + 1/5*a*d^3*x^5 + b*e^3*x^(3*r
 + 5)*log(c*x^n)/(3*r + 5) + 3*b*d*e^2*x^(2*r + 5)*log(c*x^n)/(2*r + 5) + 3
*b*d^2*e*x^(r + 5)*log(c*x^n)/(r + 5) - b*e^3*n*x^(3*r + 5)/(3*r + 5)^2 + a
*e^3*x^(3*r + 5)/(3*r + 5) - 3*b*d*e^2*n*x^(2*r + 5)/(2*r + 5)^2 + 3*a*d*e^
2*x^(2*r + 5)/(2*r + 5) - 3*b*d^2*e*n*x^(r + 5)/(r + 5)^2 + 3*a*d^2*e*x^(r
+ 5)/(r + 5)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^4\,{\left(d+e\,x^r\right)}^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d + e*x^r)^3*(a + b*log(c*x^n)),x)
[Out] int(x^4*(d + e*x^r)^3*(a + b*log(c*x^n)), x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)
[Out] Timed out
```

3.399 $\int x^2 (d+ex^r)^3 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=148

$$\frac{1}{3}\left(d^3x^3+\frac{9d^2ex^{r+3}}{r+3}+\frac{9de^2x^{2r+3}}{2r+3}+\frac{e^3x^{3(r+1)}}{r+1}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bd^3nx^3-\frac{3bd^2enx^{r+3}}{(r+3)^2}-\frac{3bde^2nx^{2r+3}}{(2r+3)^2}-\frac{be^3nx^{3(r}}{9(r+1)}$$

```
[Out] -1/9*b*d^3*n*x^3-1/9*b*e^3*n*x^(3+3*r)/(1+r)^2-3*b*d^2*e*n*x^(3+r)/(3+r)^2-
3*b*d*e^2*n*x^(3+2*r)/(3+2*r)^2+1/3*(d^3*x^3+e^3*x^(3+3*r)/(1+r)+9*d^2*e*x^
(3+r)/(3+r)+9*d*e^2*x^(3+2*r)/(3+2*r))*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.38, antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{3}\left(\frac{9d^2ex^{r+3}}{r+3}+d^3x^3+\frac{9de^2x^{2r+3}}{2r+3}+\frac{e^3x^{3(r+1)}}{r+1}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r+3}}{(r+3)^2}-\frac{1}{9}bd^3nx^3-\frac{3bde^2nx^{2r+3}}{(2r+3)^2}-\frac{be^3nx^{3(r}}{9(r+1)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^3)/9 - (b*e^3*n*x^(3*(1 + r)))/(9*(1 + r)^2) - (3*b*d^2*e*n*x^(
3 + r))/(3 + r)^2 - (3*b*d*e^2*n*x^(3 + 2*r))/(3 + 2*r)^2 + ((d^3*x^3 + (e^
3*x^(3*(1 + r)))/(1 + r) + (9*d^2*e*x^(3 + r))/(3 + r) + (9*d*e^2*x^(3 + 2*
r))/(3 + 2*r))*(a + b*Log[c*x^n]))/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^2\left(d+ex^r\right)^3\left(a+b\log\left(cx^n\right)\right)\,dx=\frac{1}{3}\left(d^3x^3+\frac{e^3x^{3(1+r)}}{1+r}+\frac{9d^2ex^{3+r}}{3+r}+\frac{9de^2x^{3+2r}}{3+2r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{3}$$
$$=\frac{1}{3}\left(d^3x^3+\frac{e^3x^{3(1+r)}}{1+r}+\frac{9d^2ex^{3+r}}{3+r}+\frac{9de^2x^{3+2r}}{3+2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}(bn)\int$$
$$=\frac{1}{3}\left(d^3x^3+\frac{e^3x^{3(1+r)}}{1+r}+\frac{9d^2ex^{3+r}}{3+r}+\frac{9de^2x^{3+2r}}{3+2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}(bn)\int($$
$$=-\frac{1}{9}bd^3nx^3-\frac{be^3nx^{3(1+r)}}{9(1+r)^2}-\frac{3bd^2enx^{3+r}}{(3+r)^2}-\frac{3bde^2nx^{3+2r}}{(3+2r)^2}+\frac{1}{3}\left(d^3x^3+\frac{e^3x^{3(1+}}{1+r}\right.$$

Mathematica [**A**] time = 0.36, size = 176, normalized size = 1.19

$$\frac{1}{9}x^3\left(3a\left(d^3+\frac{9d^2ex^r}{r+3}+\frac{9de^2x^{2r}}{2r+3}+\frac{e^3x^{3r}}{r+1}\right)+3b\log\left(cx^n\right)\left(d^3+\frac{9d^2ex^r}{r+3}+\frac{9de^2x^{2r}}{2r+3}+\frac{e^3x^{3r}}{r+1}\right)+bn\left(-d^3-\frac{27d^2ex^r}{(r+3)^2}-\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^3*(b*n*(-d^3 - (27*d^2*e*x^r)/(3 + r)^2 - (27*d*e^2*x^(2*r))/(3 + 2*r)^2
 - (e^3*x^(3*r))/(1 + r)^2) + 3*a*(d^3 + (9*d^2*e*x^r)/(3 + r) + (9*d*e^2*x
^(2*r))/(3 + 2*r) + (e^3*x^(3*r))/(1 + r)) + 3*b*(d^3 + (9*d^2*e*x^r)/(3 +
r) + (9*d*e^2*x^(2*r))/(3 + 2*r) + (e^3*x^(3*r))/(1 + r))*Log[c*x^n]))/9
```

fricas [**B**] time = 0.52, size = 1022, normalized size = 6.91

$$\frac{3\left(4\,bd^3r^6+44\,bd^3r^5+193\,bd^3r^4+432\,bd^3r^3+522\,bd^3r^2+324\,bd^3r+81\,bd^3\right)x^3\log(c)+3\left(4\,bd^3nr^6+44\,bd^3n\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/9*(3*(4*b*d^3*r^6 + 44*b*d^3*r^5 + 193*b*d^3*r^4 + 432*b*d^3*r^3 + 522*b*
d^3*r^2 + 324*b*d^3*r + 81*b*d^3)*x^3*log(c) + 3*(4*b*d^3*n*r^6 + 44*b*d^3*
n*r^5 + 193*b*d^3*n*r^4 + 432*b*d^3*n*r^3 + 522*b*d^3*n*r^2 + 324*b*d^3*n*r
 + 81*b*d^3*n)*x^3*log(x) - (4*(b*d^3*n - 3*a*d^3)*r^6 + 44*(b*d^3*n - 3*a*
d^3)*r^5 + 81*b*d^3*n + 193*(b*d^3*n - 3*a*d^3)*r^4 - 243*a*d^3 + 432*(b*d^
3*n - 3*a*d^3)*r^3 + 522*(b*d^3*n - 3*a*d^3)*r^2 + 324*(b*d^3*n - 3*a*d^3)*
r)*x^3 + (3*(4*b*e^3*r^5 + 40*b*e^3*r^4 + 153*b*e^3*r^3 + 279*b*e^3*r^2 + 2
43*b*e^3*r + 81*b*e^3)*x^3*log(c) + 3*(4*b*e^3*n*r^5 + 40*b*e^3*n*r^4 + 153
*b*e^3*n*r^3 + 279*b*e^3*n*r^2 + 243*b*e^3*n*r + 81*b*e^3*n)*x^3*log(x) + (
12*a*e^3*r^5 - 81*b*e^3*n - 4*(b*e^3*n - 30*a*e^3)*r^4 + 243*a*e^3 - 9*(4*b
*e^3*n - 51*a*e^3)*r^3 - 9*(13*b*e^3*n - 93*a*e^3)*r^2 - 81*(2*b*e^3*n - 9*
a*e^3)*r)*x^3)*x^(3*r) + 27*((2*b*d*e^2*r^5 + 19*b*d*e^2*r^4 + 68*b*d*e^2*r
^3 + 114*b*d*e^2*r^2 + 90*b*d*e^2*r + 27*b*d*e^2)*x^3*log(c) + (2*b*d*e^2*n
*r^5 + 19*b*d*e^2*n*r^4 + 68*b*d*e^2*n*r^3 + 114*b*d*e^2*n*r^2 + 90*b*d*e^2
*n*r + 27*b*d*e^2*n)*x^3*log(x) + (2*a*d*e^2*r^5 - 9*b*d*e^2*n - (b*d*e^2*n
 - 19*a*d*e^2)*r^4 + 27*a*d*e^2 - 4*(2*b*d*e^2*n - 17*a*d*e^2)*r^3 - 2*(11*
b*d*e^2*n - 57*a*d*e^2)*r^2 - 6*(4*b*d*e^2*n - 15*a*d*e^2)*r)*x^3)*x^(2*r)
+ 27*((4*b*d^2*e*r^5 + 32*b*d^2*e*r^4 + 97*b*d^2*e*r^3 + 141*b*d^2*e*r^2 +
99*b*d^2*e*r + 27*b*d^2*e)*x^3*log(c) + (4*b*d^2*e*n*r^5 + 32*b*d^2*e*n*r^4
 + 97*b*d^2*e*n*r^3 + 141*b*d^2*e*n*r^2 + 99*b*d^2*e*n*r + 27*b*d^2*e*n)*x^
3*log(x) + (4*a*d^2*e*r^5 - 9*b*d^2*e*n - 4*(b*d^2*e*n - 8*a*d^2*e)*r^4 + 2
7*a*d^2*e - (20*b*d^2*e*n - 97*a*d^2*e)*r^3 - (37*b*d^2*e*n - 141*a*d^2*e)*
r^2 - 3*(10*b*d^2*e*n - 33*a*d^2*e)*r)*x^3)*x^r)/(4*r^6 + 44*r^5 + 193*r^4
+ 432*r^3 + 522*r^2 + 324*r + 81)
```

giac [B] time = 0.46, size = 1588, normalized size = 10.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/9*(12*b*d^3*n*r^6*x^3*log(x) + 108*b*d^2*n*r^5*x^3*x^r*e*log(x) - 4*b*d^3
*n*r^6*x^3 + 12*b*d^3*r^6*x^3*log(c) + 108*b*d^2*r^5*x^3*x^r*e*log(c) + 132
*b*d^3*n*r^5*x^3*log(x) + 54*b*d*n*r^5*x^3*x^(2*r)*e^2*log(x) + 864*b*d^2*n
*r^4*x^3*x^r*e*log(x) - 44*b*d^3*n*r^5*x^3 + 12*a*d^3*r^6*x^3 - 108*b*d^2*n
*r^4*x^3*x^r*e + 108*a*d^2*r^5*x^3*x^r*e + 132*b*d^3*r^5*x^3*log(c) + 54*b*
d*r^5*x^3*x^(2*r)*e^2*log(c) + 864*b*d^2*r^4*x^3*x^r*e*log(c) + 579*b*d^3*n
*r^4*x^3*log(x) + 12*b*n*r^5*x^3*x^(3*r)*e^3*log(x) + 513*b*d*n*r^4*x^3*x^(
2*r)*e^2*log(x) + 2619*b*d^2*n*r^3*x^3*x^r*e*log(x) - 193*b*d^3*n*r^4*x^3 +
 132*a*d^3*r^5*x^3 - 27*b*d*n*r^4*x^3*x^(2*r)*e^2 + 54*a*d*r^5*x^3*x^(2*r)*
e^2 - 540*b*d^2*n*r^3*x^3*x^r*e + 864*a*d^2*r^4*x^3*x^r*e + 579*b*d^3*r^4*x
^3*log(c) + 12*b*r^5*x^3*x^(3*r)*e^3*log(c) + 513*b*d*r^4*x^3*x^(2*r)*e^2*l
og(c) + 2619*b*d^2*r^3*x^3*x^r*e*log(c) + 1296*b*d^3*n*r^3*x^3*log(x) + 120
*b*n*r^4*x^3*x^(3*r)*e^3*log(x) + 1836*b*d*n*r^3*x^3*x^(2*r)*e^2*log(x) + 3
807*b*d^2*n*r^2*x^3*x^r*e*log(x) - 432*b*d^3*n*r^3*x^3 + 579*a*d^3*r^4*x^3
- 4*b*n*r^4*x^3*x^(3*r)*e^3 + 12*a*r^5*x^3*x^(3*r)*e^3 - 216*b*d*n*r^3*x^3*
x^(2*r)*e^2 + 513*a*d*r^4*x^3*x^(2*r)*e^2 - 999*b*d^2*n*r^2*x^3*x^r*e + 261
9*a*d^2*r^3*x^3*x^r*e + 1296*b*d^3*r^3*x^3*log(c) + 120*b*r^4*x^3*x^(3*r)*e
^3*log(c) + 1836*b*d*r^3*x^3*x^(2*r)*e^2*log(c) + 3807*b*d^2*r^2*x^3*x^r*e*
log(c) + 1566*b*d^3*n*r^2*x^3*log(x) + 459*b*n*r^3*x^3*x^(3*r)*e^3*log(x) +
 3078*b*d*n*r^2*x^3*x^(2*r)*e^2*log(x) + 2673*b*d^2*n*r*x^3*x^r*e*log(x) -
522*b*d^3*n*r^2*x^3 + 1296*a*d^3*r^3*x^3 - 36*b*n*r^3*x^3*x^(3*r)*e^3 + 120
*a*r^4*x^3*x^(3*r)*e^3 - 594*b*d*n*r^2*x^3*x^(2*r)*e^2 + 1836*a*d*r^3*x^3*x
^(2*r)*e^2 - 810*b*d^2*n*r*x^3*x^r*e + 3807*a*d^2*r^2*x^3*x^r*e + 1566*b*d^
3*r^2*x^3*log(c) + 459*b*r^3*x^3*x^(3*r)*e^3*log(c) + 3078*b*d*r^2*x^3*x^(2
*r)*e^2*log(c) + 2673*b*d^2*r*x^3*x^r*e*log(c) + 972*b*d^3*n*r*x^3*log(x) +
 837*b*n*r^2*x^3*x^(3*r)*e^3*log(x) + 2430*b*d*n*r*x^3*x^(2*r)*e^2*log(x) +
 729*b*d^2*n*x^3*x^r*e*log(x) - 324*b*d^3*n*r*x^3 + 1566*a*d^3*r^2*x^3 - 11
7*b*n*r^2*x^3*x^(3*r)*e^3 + 459*a*r^3*x^3*x^(3*r)*e^3 - 648*b*d*n*r*x^3*x^(
2*r)*e^2 + 3078*a*d*r^2*x^3*x^(2*r)*e^2 - 243*b*d^2*n*x^3*x^r*e + 2673*a*d^
2*r*x^3*x^r*e + 972*b*d^3*r*x^3*log(c) + 837*b*r^2*x^3*x^(3*r)*e^3*log(c) +
 2430*b*d*r*x^3*x^(2*r)*e^2*log(c) + 729*b*d^2*x^3*x^r*e*log(c) + 243*b*d^3
*n*x^3*log(x) + 729*b*n*r*x^3*x^(3*r)*e^3*log(x) + 729*b*d*n*x^3*x^(2*r)*e^
2*log(x) - 81*b*d^3*n*x^3 + 972*a*d^3*r*x^3 - 162*b*n*r*x^3*x^(3*r)*e^3 + 8
37*a*r^2*x^3*x^(3*r)*e^3 - 243*b*d*n*x^3*x^(2*r)*e^2 + 2430*a*d*r*x^3*x^(2*
r)*e^2 + 729*a*d^2*x^3*x^r*e + 243*b*d^3*x^3*log(c) + 729*b*r*x^3*x^(3*r)*e
^3*log(c) + 729*b*d*x^3*x^(2*r)*e^2*log(c) + 243*b*n*x^3*x^(3*r)*e^3*log(x)
 + 243*a*d^3*x^3 - 81*b*n*x^3*x^(3*r)*e^3 + 729*a*r*x^3*x^(3*r)*e^3 + 729*a
*d*x^3*x^(2*r)*e^2 + 243*b*x^3*x^(3*r)*e^3*log(c) + 243*a*x^3*x^(3*r)*e^3)/
(4*r^6 + 44*r^5 + 193*r^4 + 432*r^3 + 522*r^2 + 324*r + 81)
```

maple [C] time = 0.50, size = 4027, normalized size = 27.21

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+e*x^r)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] 1/3*b*x^3*(2*e^3*r^2*(x^r)^3+9*d*e^2*r^2*(x^r)^2+9*e^3*r*(x^r)^3+2*d^3*r^3+
18*d^2*e*r^2*x^r+36*d*e^2*r*(x^r)^2+9*e^3*(x^r)^3+11*d^3*r^2+45*d^2*e*r*x^r
+27*d*e^2*(x^r)^2+18*d^3*r+27*d^2*e*x^r+9*d^3)/(r+1)/(2*r+3)/(r+3)*ln(x^n)-
1/18*x^3*(-264*a*d^3*r^5-1158*a*d^3*r^4+3807*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*x^r+8*b*d^3*n*r^6+88*b*d^3*n*r^5+386*b*d^3*n*r^4-486
```

*a*e^3*(x^r)^3-486*a*d^3-24*ln(c)*b*d^3*r^6-264*ln(c)*b*d^3*r^5-1158*ln(c)*
b*d^3*r^4-2592*ln(c)*b*d^3*r^3-3132*ln(c)*b*d^3*r^2-1944*ln(c)*b*d^3*r-24*a
*d^3*r^6+162*b*d^3*n-24*a*e^3*r^5*(x^r)^3-240*a*e^3*r^4*(x^r)^3-486*ln(c)*b
e^3(x^r)^3+162*b*e^3*n*(x^r)^3-918*a*e^3*r^3*(x^r)^3-1674*a*e^3*r^2*(x^r)
^3-1458*a*e^3*r*(x^r)^3-1458*a*d*e^2*(x^r)^2-1458*a*d^2*e*x^r-486*b*d^3*ln(
c)+864*b*d^3*n*r^3+1044*b*d^3*n*r^2+648*b*d^3*n*r-132*I*Pi*b*d^3*r^5*csgn(I
*x^n)*csgn(I*c*x^n)^2+729*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-243*I*Pi*b*e
^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+729*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^
r)^3+3078*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+864*
I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-2592*a*d^3*r^3-313
2*a*d^3*r^2-1944*a*d^3*r+243*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3-243*I*Pi*b*
d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-243*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+12
*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+132*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3+1296*I*P
i*b*d^3*r^3*csgn(I*c*x^n)^3-4860*ln(c)*b*d*e^2*r*(x^r)^2-5238*ln(c)*b*d^2*e
*r^3*x^r-7614*ln(c)*b*d^2*e*r^2*x^r-5346*ln(c)*b*d^2*e*r*x^r-3672*ln(c)*b*d
*e^2*r^3*(x^r)^2-6156*ln(c)*b*d*e^2*r^2*(x^r)^2+1620*b*d^2*e*n*r*x^r+1188*b
*d*e^2*n*r^2*(x^r)^2+1998*b*d^2*e*n*r^2*x^r+120*I*Pi*b*e^3*r^4*csgn(I*c*x^n
)^3*(x^r)^3-579*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-579*I*Pi*b*d^3*r
^4*csgn(I*c*x^n)^2*csgn(I*c)+729*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*x^r-3807*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-2430*I*Pi*b*
d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1566*I*Pi*b*d^3*r^2*csgn(I*c*x^
n)^3+972*I*Pi*b*d^3*r*csgn(I*c*x^n)^3+2430*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*(x^r)^2+2673*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*x^r+2619*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2
43*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-12*I*Pi*b*d^3*r^6*csgn(I*
x^n)*csgn(I*c*x^n)^2-1296*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)-1566*I*P
i*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)+486*b*d^2*e*n*x^r-3672*a*d*e^2*r^3*(x
^r)^2-6156*a*d*e^2*r^2*(x^r)^2-4860*a*d*e^2*r*(x^r)^2-5238*a*d^2*e*r^3*x^r-
7614*a*d^2*e*r^2*x^r+837*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*(x^r)^3+579*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3+54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*x^r-54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+
729*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-729*I*Pi*b*d*e
^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-729*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*
c*x^n)^2*x^r-729*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-837*I*Pi*b*e^3*
r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+972*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)+12*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+132
*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+243*I*Pi*b*e^3*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-3078*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(
I*c*x^n)^2*(x^r)^2-3078*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+
459*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-1836*I*Pi*b*
d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+729*I*Pi*b*d^2*e*csgn(I*c*x^n
)^3*x^r+12*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3-132*I*Pi*b*d^3*r^5*csgn(I
*c*x^n)^2*csgn(I*c)-243*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+1836*I
*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-2619*I*Pi*b*d^2
*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+729*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*(x^r)^3-3807*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*
x^r-2673*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-2673*I*Pi*b*d^2*e*r
*csgn(I*c*x^n)^2*csgn(I*c)*x^r-2619*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I
*c)*x^r-1836*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-459*I*Pi*b*
e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-459*I*Pi*b*e^3*r^3*csgn(I*c*x^n
)^2*csgn(I*c)*(x^r)^3+1566*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)+1296*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+72*b*e^3*n*r^3*(
x^r)^3-108*a*d*e^2*r^5*(x^r)^2-1026*a*d*e^2*r^4*(x^r)^2-216*a*d^2*e*r^5*x^r
-1728*a*d^2*e*r^4*x^r+234*b*e^3*n*r^2*(x^r)^3+324*b*e^3*n*r*(x^r)^3+486*b*d
*e^2*n*(x^r)^2+243*I*Pi*b*d^3*csgn(I*c*x^n)^3+8*b*e^3*n*r^4*(x^r)^3-5346*a*
d^2*e*r*x^r-1458*ln(c)*b*d^2*e*x^r-1458*ln(c)*b*d*e^2*(x^r)^2-24*ln(c)*b*e^
3*r^5*(x^r)^3-240*ln(c)*b*e^3*r^4*(x^r)^3-918*ln(c)*b*e^3*r^3*(x^r)^3-1674*
ln(c)*b*e^3*r^2*(x^r)^3-1458*ln(c)*b*e^3*r*(x^r)^3+54*I*Pi*b*d*e^2*r^5*csgn

```
(I*c*x^n)^3*(x^r)^2+108*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r+2673*I*Pi*b*d^
2*e*r*csgn(I*c*x^n)^3*x^r-729*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^
2-108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-108*I*Pi*b*d^2*e*r^5
*csgn(I*c*x^n)^2*csgn(I*c)*x^r+12*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*(x^r)^3-729*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-12*I*P
i*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)+864*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*
x^r+579*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-120*I*Pi*b*e^3*r
^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-120*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*c
sgn(I*c)*(x^r)^3+513*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2+120*I*Pi*b*e^
3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-513*I*Pi*b*d*e^2*r^4*csgn
(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-513*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I
*c)*(x^r)^2-1566*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1296*I*Pi*b*d^3
*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-972*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)
^2-972*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)+837*I*Pi*b*e^3*r^2*csgn(I*c*x
^n)^3*(x^r)^3+459*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+1296*b*d*e^2*n*r*(
x^r)^2-108*ln(c)*b*d*e^2*r^5*(x^r)^2-1026*ln(c)*b*d*e^2*r^4*(x^r)^2-216*ln(
c)*b*d^2*e*r^5*x^r-1728*ln(c)*b*d^2*e*r^4*x^r+54*b*d*e^2*n*r^4*(x^r)^2+432*
b*d*e^2*n*r^3*(x^r)^2+216*b*d^2*e*n*r^4*x^r+1080*b*d^2*e*n*r^3*x^r-729*I*Pi
*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+3807*I*Pi*b*d^2*e*r^2*csgn(I*c
*x^n)^3*x^r+2430*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+1836*I*Pi*b*d*e^2*r
^3*csgn(I*c*x^n)^3*(x^r)^2-864*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2
*x^r-864*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r-2430*I*Pi*b*d*e^2*r
*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-54*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn
(I*c)*(x^r)^2-837*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+2619*I*P
i*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r+3078*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^
r)^2-12*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-12*I*Pi*b*e^3*r^
5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+513*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*(x^r)^2)/(r+1)^2/(2*r+3)^2/(r+3)^2
```

maxima [A] time = 1.35, size = 224, normalized size = 1.51

$$-\frac{1}{9}\,bd^3nx^3+\frac{1}{3}\,bd^3x^3\log\left(cx^n\right)+\frac{1}{3}\,ad^3x^3+\frac{be^3x^{3\,r+3}\log\left(cx^n\right)}{3\,(r+1)}+\frac{3\,bde^2x^{2\,r+3}\log\left(cx^n\right)}{2\,r+3}+\frac{3\,bd^2ex^{r+3}\log\left(cx^n\right)}{r+3}-\frac{be^3n}{9\,(r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/9*b*d^3*n*x^3 + 1/3*b*d^3*x^3*log(c*x^n) + 1/3*a*d^3*x^3 + 1/3*b*e^3*x^(
3*r + 3)*log(c*x^n)/(r + 1) + 3*b*d*e^2*x^(2*r + 3)*log(c*x^n)/(2*r + 3) +
3*b*d^2*e*x^(r + 3)*log(c*x^n)/(r + 3) - 1/9*b*e^3*n*x^(3*r + 3)/(r + 1)^2
+ 1/3*a*e^3*x^(3*r + 3)/(r + 1) - 3*b*d*e^2*n*x^(2*r + 3)/(2*r + 3)^2 + 3*a
*d*e^2*x^(2*r + 3)/(2*r + 3) - 3*b*d^2*e*n*x^(r + 3)/(r + 3)^2 + 3*a*d^2*e*
x^(r + 3)/(r + 3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^2\,{\left(d+e\,x^r\right)}^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d + e*x^r)^3*(a + b*log(c*x^n)),x)
```

```
[Out] int(x^2*(d + e*x^r)^3*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.400 $\int (d+ex^r)^3 \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=169

$$d^3x\left(a+b\log\left(cx^n\right)\right)+\frac{3d^2ex^{r+1}\left(a+b\log\left(cx^n\right)\right)}{r+1}+\frac{3de^2x^{2r+1}\left(a+b\log\left(cx^n\right)\right)}{2r+1}+\frac{e^3x^{3r+1}\left(a+b\log\left(cx^n\right)\right)}{3r+1}-bd^3nx-$$

```
[Out] -b*d^3*n*x-3*b*d^2*e*n*x^(1+r)/(1+r)^2-3*b*d*e^2*n*x^(1+2*r)/(1+2*r)^2-b*e^
3*n*x^(1+3*r)/(1+3*r)^2+d^3*x*(a+b*ln(c*x^n))+3*d^2*e*x^(1+r)*(a+b*ln(c*x^n
))/(1+r)+3*d*e^2*x^(1+2*r)*(a+b*ln(c*x^n))/(1+2*r)+e^3*x^(1+3*r)*(a+b*ln(c*
x^n))/(1+3*r)
```

Rubi [A] time = 0.10, antiderivative size = 141, normalized size of antiderivative = 0.83, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {244, 2313}

$$\left(\frac{3d^2ex^{r+1}}{r+1}+d^3x+\frac{3de^2x^{2r+1}}{2r+1}+\frac{e^3x^{3r+1}}{3r+1}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r+1}}{(r+1)^2}-bd^3nx-\frac{3bde^2nx^{2r+1}}{(2r+1)^2}-\frac{be^3nx^{3r+1}}{(3r+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x) - (3*b*d^2*e*n*x^(1 + r))/(1 + r)^2 - (3*b*d*e^2*n*x^(1 + 2*r)
)/(1 + 2*r)^2 - (b*e^3*n*x^(1 + 3*r))/(1 + 3*r)^2 + (d^3*x + (3*d^2*e*x^(1
+ r))/(1 + r) + (3*d*e^2*x^(1 + 2*r))/(1 + 2*r) + (e^3*x^(1 + 3*r))/(1 + 3*
r))*(a + b*Log[c*x^n])
```

Rule 244

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && IGtQ[p, 0]
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\int (d+ex^r)^3\left(a+b\log\left(cx^n\right)\right)dx=\left(d^3x+\frac{3d^2ex^{1+r}}{1+r}+\frac{3de^2x^{1+2r}}{1+2r}+\frac{e^3x^{1+3r}}{1+3r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(d^3+\frac{3d}{1}\right.$$

$$=-bd^3nx-\frac{3bd^2enx^{1+r}}{(1+r)^2}-\frac{3bde^2nx^{1+2r}}{(1+2r)^2}-\frac{be^3nx^{1+3r}}{(1+3r)^2}+\left(d^3x+\frac{3d^2ex^{1+r}}{1+r}+\frac{3de^2}{1+}\right.$$

Mathematica [A] time = 0.24, size = 159, normalized size = 0.94

$$x\left(\frac{3d^2ex^r\left(a+b\log\left(cx^n\right)\right)}{r+1}+\frac{3de^2x^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r+1}+\frac{e^3x^{3r}\left(a+b\log\left(cx^n\right)\right)}{3r+1}+ad^3+bd^3\log\left(cx^n\right)-bd^3n-\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(a*d^3 - b*d^3*n - (3*b*d^2*e*n*x^r)/(1 + r)^2 - (3*b*d*e^2*n*x^(2*r))/(1
 + 2*r)^2 - (b*e^3*n*x^(3*r))/(1 + 3*r)^2 + b*d^3*Log[c*x^n] + (3*d^2*e*x^r
*(a + b*Log[c*x^n]))/(1 + r) + (3*d*e^2*x^(2*r)*(a + b*Log[c*x^n]))/(1 + 2*
r) + (e^3*x^(3*r)*(a + b*Log[c*x^n]))/(1 + 3*r))
```

fricas [B] time = 0.53, size = 983, normalized size = 5.82

$$\frac{\left(36\,bd^3r^6 + 132\,bd^3r^5 + 193\,bd^3r^4 + 144\,bd^3r^3 + 58\,bd^3r^2 + 12\,bd^3r + bd^3\right)x\log(c) + \left(36\,bd^3nr^6 + 132\,bd^3nr^5\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((36*b*d^3*r^6 + 132*b*d^3*r^5 + 193*b*d^3*r^4 + 144*b*d^3*r^3 + 58*b*d^3*r
^2 + 12*b*d^3*r + b*d^3)*x*log(c) + (36*b*d^3*n*r^6 + 132*b*d^3*n*r^5 + 193
*b*d^3*n*r^4 + 144*b*d^3*n*r^3 + 58*b*d^3*n*r^2 + 12*b*d^3*n*r + b*d^3*n)*x
*log(x) - (36*(b*d^3*n - a*d^3)*r^6 + 132*(b*d^3*n - a*d^3)*r^5 + b*d^3*n +
 193*(b*d^3*n - a*d^3)*r^4 - a*d^3 + 144*(b*d^3*n - a*d^3)*r^3 + 58*(b*d^3*
n - a*d^3)*r^2 + 12*(b*d^3*n - a*d^3)*r)*x + ((12*b*e^3*r^5 + 40*b*e^3*r^4
+ 51*b*e^3*r^3 + 31*b*e^3*r^2 + 9*b*e^3*r + b*e^3)*x*log(c) + (12*b*e^3*n*r
^5 + 40*b*e^3*n*r^4 + 51*b*e^3*n*r^3 + 31*b*e^3*n*r^2 + 9*b*e^3*n*r + b*e^3
*n)*x*log(x) + (12*a*e^3*r^5 - b*e^3*n - 4*(b*e^3*n - 10*a*e^3)*r^4 + a*e^3
 - 3*(4*b*e^3*n - 17*a*e^3)*r^3 - (13*b*e^3*n - 31*a*e^3)*r^2 - 3*(2*b*e^3*
n - 3*a*e^3)*r)*x)*x^(3*r) + 3*((18*b*d*e^2*r^5 + 57*b*d*e^2*r^4 + 68*b*d*e
^2*r^3 + 38*b*d*e^2*r^2 + 10*b*d*e^2*r + b*d*e^2)*x*log(c) + (18*b*d*e^2*n*
r^5 + 57*b*d*e^2*n*r^4 + 68*b*d*e^2*n*r^3 + 38*b*d*e^2*n*r^2 + 10*b*d*e^2*n
*r + b*d*e^2*n)*x*log(x) + (18*a*d*e^2*r^5 - b*d*e^2*n - 3*(3*b*d*e^2*n - 1
9*a*d*e^2)*r^4 + a*d*e^2 - 4*(6*b*d*e^2*n - 17*a*d*e^2)*r^3 - 2*(11*b*d*e^2
*n - 19*a*d*e^2)*r^2 - 2*(4*b*d*e^2*n - 5*a*d*e^2)*r)*x)*x^(2*r) + 3*((36*b
*d^2*e*r^5 + 96*b*d^2*e*r^4 + 97*b*d^2*e*r^3 + 47*b*d^2*e*r^2 + 11*b*d^2*e*
r + b*d^2*e)*x*log(c) + (36*b*d^2*e*n*r^5 + 96*b*d^2*e*n*r^4 + 97*b*d^2*e*n
*r^3 + 47*b*d^2*e*n*r^2 + 11*b*d^2*e*n*r + b*d^2*e*n)*x*log(x) + (36*a*d^2*
e*r^5 - b*d^2*e*n - 12*(3*b*d^2*e*n - 8*a*d^2*e)*r^4 + a*d^2*e - (60*b*d^2*
e*n - 97*a*d^2*e)*r^3 - (37*b*d^2*e*n - 47*a*d^2*e)*r^2 - (10*b*d^2*e*n - 1
1*a*d^2*e)*r)*x)*x^r)/(36*r^6 + 132*r^5 + 193*r^4 + 144*r^3 + 58*r^2 + 12*r
 + 1)
```

giac [B] time = 0.33, size = 374, normalized size = 2.21

$$\frac{3\,bd^2nrxx^re\log(x)}{r^2+2\,r+1}+bd^3nx\log(x)+\frac{6\,bdnrxx^{2\,r}e^2\log(x)}{4\,r^2+4\,r+1}+\frac{3\,bd^2nxx^re\log(x)}{r^2+2\,r+1}-bd^3nx-\frac{3\,bd^2nxx^re}{r^2+2\,r+1}+bd^3x\log(c)+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 3*b*d^2*n*r*x*x^r*e*log(x)/(r^2 + 2*r + 1) + b*d^3*n*x*log(x) + 6*b*d*n*r*x
*x^(2*r)*e^2*log(x)/(4*r^2 + 4*r + 1) + 3*b*d^2*n*x*x^r*e*log(x)/(r^2 + 2*r
 + 1) - b*d^3*n*x - 3*b*d^2*n*x*x^r*e/(r^2 + 2*r + 1) + b*d^3*x*log(c) + 3*
b*d^2*x*x^r*e*log(c)/(r + 1) + 3*b*n*r*x*x^(3*r)*e^3*log(x)/(9*r^2 + 6*r +
1) + 3*b*d*n*x*x^(2*r)*e^2*log(x)/(4*r^2 + 4*r + 1) + a*d^3*x - 3*b*d*n*x*x
^(2*r)*e^2/(4*r^2 + 4*r + 1) + 3*a*d^2*x*x^r*e/(r + 1) + 3*b*d*x*x^(2*r)*e^
2*log(c)/(2*r + 1) + b*n*x*x^(3*r)*e^3*log(x)/(9*r^2 + 6*r + 1) - b*n*x*x^(
3*r)*e^3/(9*r^2 + 6*r + 1) + 3*a*d*x*x^(2*r)*e^2/(2*r + 1) + b*x*x^(3*r)*e^
3*log(c)/(3*r + 1) + a*x*x^(3*r)*e^3/(3*r + 1)
```

maple [C] time = 0.49, size = 4023, normalized size = 23.80

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] b*x*(2*e^3*r^2*(x^r)^3+9*d*e^2*r^2*(x^r)^2+3*e^3*r*(x^r)^3+6*d^3*r^3+18*d^2
*e*r^2*x^r+12*d*e^2*r*(x^r)^2+e^3*(x^r)^3+11*d^3*r^2+15*d^2*e*r*x^r+3*d*e^2
*(x^r)^2+6*d^3*r+3*d^2*e*x^r+d^3)/(1+3*r)/(2*r+1)/(r+1)*ln(x^n)-1/2*x*(-264
*a*d^3*r^5-386*a*d^3*r^4+171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*(x^r)^2+72*b*d^3*n*r^6+264*b*d^3*n*r^5+386*b*d^3*n*r^4-2*a*e^3*(x^r)
^3-2*a*d^3+9*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-141*I
*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-30*I*Pi*b*d*e^2*r*csgn(I*c*
x^n)^2*csgn(I*c)*(x^r)^2-72*ln(c)*b*d^3*r^6-264*ln(c)*b*d^3*r^5-386*ln(c)*b
*d^3*r^4-288*ln(c)*b*d^3*r^3-116*ln(c)*b*d^3*r^2-24*ln(c)*b*d^3*r-72*a*d^3*
r^6+2*b*d^3*n-24*a*e^3*r^5*(x^r)^3-80*a*e^3*r^4*(x^r)^3-2*ln(c)*b*e^3*(x^r)
^3+2*b*e^3*n*(x^r)^3-102*a*e^3*r^3*(x^r)^3-62*a*e^3*r^2*(x^r)^3-18*a*e^3*r*
(x^r)^3-6*a*d*e^2*(x^r)^2-6*a*d^2*e*x^r+114*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*(x^r)^2-2*b*d^3*ln(c)+288*b*d^3*n*r^3+116*b*d^3*n*r^2
+24*b*d^3*n*r-132*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*e^3*csg
n(I*c*x^n)^2*csgn(I*c)*(x^r)^3-58*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^
2-288*a*d^3*r^3-116*a*d^3*r^2-24*a*d^3*r+132*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3
-60*ln(c)*b*d*e^2*r*(x^r)^2-582*ln(c)*b*d^2*e*r^3*x^r-282*ln(c)*b*d^2*e*r^2
*x^r-66*ln(c)*b*d^2*e*r*x^r-408*ln(c)*b*d*e^2*r^3*(x^r)^2-228*ln(c)*b*d*e^2
*r^2*(x^r)^2+60*b*d^2*e*n*r*x^r+132*b*d*e^2*n*r^2*(x^r)^2+222*b*d^2*e*n*r^2
*x^r-291*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-171*I*Pi*b*d*e^2*r^
4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*
csgn(I*c)*(x^r)^2-51*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-51*
I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+58*I*Pi*b*d^3*r^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)+144*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)+I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-36*I*Pi*b*d^3*r^6*cs
gn(I*c*x^n)^2*csgn(I*c)+3*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-I*Pi*b*e^3*c
sgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-30*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x
^n)^2*(x^r)^2+3*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+31
*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+6*b*d^2*e*n*x^r
-408*a*d*e^2*r^3*(x^r)^2-228*a*d*e^2*r^2*(x^r)^2-60*a*d*e^2*r*(x^r)^2-582*a
*d^2*e*r^3*x^r-282*a*d^2*e*r^2*x^r+288*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*x^r+171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2+I*Pi*b*e^
3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+40*I*Pi*b*e^3*r^4*csgn(I*c*x^
n)^3*(x^r)^3-193*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+54*I*Pi*b*d*e^2
*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+108*I*Pi*b*d^2*e*r^5*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c
*x^n)^2*(x^r)^2+132*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-12*I
*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)+12*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^
r)^3-36*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2-132*I*Pi*b*d^3*r^5*csgn(
I*c*x^n)^2*csgn(I*c)-144*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)-204*I*Pi*
b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-204*I*Pi*b*d*e^2*r^3*csgn(I
*c*x^n)^2*csgn(I*c)*(x^r)^2-291*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^
2*x^r+288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+193*I*Pi*b*d^3*r^4*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+193*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3+I*Pi*b*d^3*cs
gn(I*c*x^n)^3+24*b*e^3*n*r^3*(x^r)^3-108*a*d*e^2*r^5*(x^r)^2-342*a*d*e^2*r^
4*(x^r)^2-216*a*d^2*e*r^5*x^r-576*a*d^2*e*r^4*x^r+26*b*e^3*n*r^2*(x^r)^3+12
*b*e^3*n*r*(x^r)^3+6*b*d*e^2*n*(x^r)^2-33*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I
*c*x^n)^2*x^r-33*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+3*I*Pi*b*d^2*
e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-141*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n
)^2*csgn(I*c)*x^r+8*b*e^3*n*r^4*(x^r)^3-66*a*d^2*e*r*x^r-6*ln(c)*b*d^2*e*x^
r-6*ln(c)*b*d*e^2*(x^r)^2-24*ln(c)*b*e^3*r^5*(x^r)^3-80*ln(c)*b*e^3*r^4*(x^
r)^3-102*ln(c)*b*e^3*r^3*(x^r)^3-62*ln(c)*b*e^3*r^2*(x^r)^3-18*ln(c)*b*e^3*
r*(x^r)^3-9*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+141*I*Pi*b*d^2*e
*r^2*csgn(I*c*x^n)^3*x^r+30*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+204*I*Pi
*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-58*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn
(I*c)+54*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2+108*I*Pi*b*d^2*e*r^5*csgn
(I*c*x^n)^3*x^r-288*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-114*I*
Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-114*I*Pi*b*d*e^2*r^2*csg
```

```
n(I*c*x^n)^2*csgn(I*c)*(x^r)^2+51*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*(x^r)^3-108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-108*
I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r+12*I*Pi*b*e^3*r^5*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+12*I*Pi*b*d^3*r*csgn(I*c*x^n)^3-I*Pi*b*d^
3*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+144*I*Pi
*b*d^3*r^3*csgn(I*c*x^n)^3+I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+58*I*Pi*b*d^3
*r^2*csgn(I*c*x^n)^3+141*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*x^r+30*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-144*I*
Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I
*c*x^n)^2-40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-40*I*Pi*b*e
^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)
^2*csgn(I*c)*x^r+40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r
)^3+48*b*d*e^2*n*r*(x^r)^2-108*ln(c)*b*d*e^2*r^5*(x^r)^2-342*ln(c)*b*d*e^2*
r^4*(x^r)^2-216*ln(c)*b*d^2*e*r^5*x^r-576*ln(c)*b*d^2*e*r^4*x^r+54*b*d*e^2*
n*r^4*(x^r)^2+144*b*d*e^2*n*r^3*(x^r)^2+216*b*d^2*e*n*r^4*x^r+360*b*d^2*e*n
*r^3*x^r-31*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+291*I*Pi*b*d^2
*e*r^3*csgn(I*c*x^n)^3*x^r+114*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-9*I
*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+9*I*Pi*b*e^3*r*csgn(I*c*x^n
)^3*(x^r)^3+31*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3+51*I*Pi*b*e^3*r^3*csg
n(I*c*x^n)^3*(x^r)^3+3*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+33*I*Pi*b*d^2*e*r*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+291*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*x^r+204*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*(x^r)^2-54*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+33*I*P
i*b*d^2*e*r*csgn(I*c*x^n)^3*x^r-3*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x
^r)^2+12*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+36*I*Pi*b*d^3*r^6
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^
n)^2*(x^r)^2-3*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-3*I*Pi*b*d^2*e*
csgn(I*c*x^n)^2*csgn(I*c)*x^r-31*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2
*(x^r)^3-12*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-12*I*Pi*b*e^
3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-193*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*
csgn(I*c)+36*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3)/(1+3*r)^2/(2*r+1)^2/(r+1)^2
```

maxima [A] time = 1.44, size = 220, normalized size = 1.30

$$-bd^3nx+bd^3x\log(cx^n)+ad^3x+\frac{be^3x^{3r+1}\log(cx^n)}{3r+1}+\frac{3bde^2x^{2r+1}\log(cx^n)}{2r+1}+\frac{3bd^2ex^{r+1}\log(cx^n)}{r+1}-\frac{be^3nx^{3r+1}}{(3r+1)^2}+\frac{ae}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -b*d^3*n*x + b*d^3*x*log(c*x^n) + a*d^3*x + b*e^3*x^(3*r + 1)*log(c*x^n)/(3
*r + 1) + 3*b*d*e^2*x^(2*r + 1)*log(c*x^n)/(2*r + 1) + 3*b*d^2*e*x^(r + 1)*
log(c*x^n)/(r + 1) - b*e^3*n*x^(3*r + 1)/(3*r + 1)^2 + a*e^3*x^(3*r + 1)/(3
*r + 1) - 3*b*d*e^2*n*x^(2*r + 1)/(2*r + 1)^2 + 3*a*d*e^2*x^(2*r + 1)/(2*r
+ 1) - 3*b*d^2*e*n*x^(r + 1)/(r + 1)^2 + 3*a*d^2*e*x^(r + 1)/(r + 1)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (d+e\,x^r)^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*x^r)^3*(a + b*log(c*x^n)),x)
```

```
[Out] int((d + e*x^r)^3*(a + b*log(c*x^n)), x)
```

sympy [A] time = 22.76, size = 325, normalized size = 1.92

$$ad^3x+3ad^2e\left(\begin{cases}\frac{x^{r+1}}{r+1} & \text{for } r\neq -1\\ \log(x) & \text{otherwise}\end{cases}\right)+3ade^2\left(\begin{cases}\frac{x^{2r+1}}{2r+1} & \text{for } 2r\neq -1\\ \log(x) & \text{otherwise}\end{cases}\right)+ae^3\left(\begin{cases}\frac{x^{3r+1}}{3r+1} & \text{for } 3r\neq -1\\ \log(x) & \text{otherwise}\end{cases}\right)-bd^3nx+bd^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x + 3*a*d**2*e*Piecewise((x**(r + 1)/(r + 1), Ne(r, -1)), (log(x), T
rue)) + 3*a*d*e**2*Piecewise((x**(2*r + 1)/(2*r + 1), Ne(2*r, -1)), (log(x)
, True)) + a*e**3*Piecewise((x**(3*r + 1)/(3*r + 1), Ne(3*r, -1)), (log(x),
 True)) - b*d**3*n*x + b*d**3*x*log(c*x**n) - 3*b*d**2*e*n*Piecewise((Piece
wise((x*x**r/(r + 1), Ne(r, -1)), (log(x), True))/(r + 1), (r > -oo) & (r <
 oo) & Ne(r, -1)), (log(x)**2/2, True)) + 3*b*d**2*e*Piecewise((x**(r + 1)/
(r + 1), Ne(r, -1)), (log(x), True))*log(c*x**n) - 3*b*d*e**2*n*Piecewise((
Piecewise((x*x**(2*r)/(2*r + 1), Ne(r, -1/2)), (log(x), True))/(2*r + 1), (
r > -oo) & (r < oo) & Ne(r, -1/2)), (log(x)**2/2, True)) + 3*b*d*e**2*Piece
wise((x**(2*r + 1)/(2*r + 1), Ne(2*r, -1)), (log(x), True))*log(c*x**n) - b
*e**3*n*Piecewise((Piecewise((x*x**(3*r)/(3*r + 1), Ne(r, -1/3)), (log(x),
True))/(3*r + 1), (r > -oo) & (r < oo) & Ne(r, -1/3)), (log(x)**2/2, True))
 + b*e**3*Piecewise((x**(3*r + 1)/(3*r + 1), Ne(3*r, -1)), (log(x), True))*
log(c*x**n)
```

3.401 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=179

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{3d^2ex^{r-1}\left(a+b\log\left(cx^n\right)\right)}{1-r}-\frac{3de^2x^{2r-1}\left(a+b\log\left(cx^n\right)\right)}{1-2r}-\frac{e^3x^{3r-1}\left(a+b\log\left(cx^n\right)\right)}{1-3r}-\frac{bd^3n}{x}$$

```
[Out] -b*d^3*n/x-3*b*d^2*e*n*x^(-1+r)/(1-r)^2-3*b*d*e^2*n*x^(-1+2*r)/(1-2*r)^2-b*
e^3*n*x^(-1+3*r)/(1-3*r)^2-d^3*(a+b*ln(c*x^n))/x-3*d^2*e*x^(-1+r)*(a+b*ln(c
*x^n))/(1-r)-3*d*e^2*x^(-1+2*r)*(a+b*ln(c*x^n))/(1-2*r)-e^3*x^(-1+3*r)*(a+b
*ln(c*x^n))/(1-3*r)
```

Rubi [A] time = 0.40, antiderivative size = 150, normalized size of antiderivative = 0.84, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {270, 2334, 14}

$$-\left(\frac{3d^2ex^{r-1}}{1-r}+\frac{d^3}{x}+\frac{3de^2x^{2r-1}}{1-2r}+\frac{e^3x^{3r-1}}{1-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r-1}}{(1-r)^2}-\frac{bd^3n}{x}-\frac{3bde^2nx^{2r-1}}{(1-2r)^2}-\frac{be^3nx^{3r-1}}{(1-3r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^3*n)/x) - (3*b*d^2*e*n*x^(-1 + r))/(1 - r)^2 - (3*b*d*e^2*n*x^(-1 +
2*r))/(1 - 2*r)^2 - (b*e^3*n*x^(-1 + 3*r))/(1 - 3*r)^2 - (d^3/x + (3*d^2*e*
x^(-1 + r))/(1 - r) + (3*d*e^2*x^(-1 + 2*r))/(1 - 2*r) + (e^3*x^(-1 + 3*r))
/(1 - 3*r))*(a + b*Log[c*x^n])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int\frac{(d+ex^r)^3\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx=-\left(\frac{d^3}{x}+\frac{3d^2ex^{-1+r}}{1-r}+\frac{3de^2x^{-1+2r}}{1-2r}+\frac{e^3x^{-1+3r}}{1-3r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int -$$

$$=-\left(\frac{d^3}{x}+\frac{3d^2ex^{-1+r}}{1-r}+\frac{3de^2x^{-1+2r}}{1-2r}+\frac{e^3x^{-1+3r}}{1-3r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\Bigg(-$$

$$=-\frac{bd^3n}{x}-\frac{3bd^2enx^{-1+r}}{(1-r)^2}-\frac{3bde^2nx^{-1+2r}}{(1-2r)^2}-\frac{be^3nx^{-1+3r}}{(1-3r)^2}-\Bigg(\frac{d^3}{x}+\frac{3d^2ex^{-1+r}}{1-r}+$$

Mathematica [A] time = 0.42, size = 181, normalized size = 1.01

$$\frac{a\left(-d^3+\frac{3d^2ex^r}{r-1}+\frac{3de^2x^{2r}}{2r-1}+\frac{e^3x^{3r}}{3r-1}\right)+b\log\left(cx^n\right)\left(-d^3+\frac{3d^2ex^r}{r-1}+\frac{3de^2x^{2r}}{2r-1}+\frac{e^3x^{3r}}{3r-1}\right)+bn\left(-d^3-\frac{3d^2ex^r}{(r-1)^2}-\frac{3de^2x^{2r}}{(1-2r)^2}-\frac{e^3x^{3r}}{(1-3r)^2}\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] (b*n*(-d^3 - (3*d^2*e*x^r)/(-1 + r)^2 - (3*d*e^2*x^(2*r))/(1 - 2*r)^2 - (e^
3*x^(3*r))/(1 - 3*r)^2) + a*(-d^3 + (3*d^2*e*x^r)/(-1 + r) + (3*d*e^2*x^(2*
r))/(-1 + 2*r) + (e^3*x^(3*r))/(-1 + 3*r)) + b*(-d^3 + (3*d^2*e*x^r)/(-1 +
r) + (3*d*e^2*x^(2*r))/(-1 + 2*r) + (e^3*x^(3*r))/(-1 + 3*r))*Log[c*x^n])/x
```

fricas [B] time = 0.47, size = 967, normalized size = 5.40

$$-\frac{36\left(bd^3n+ad^3\right)r^6-132\left(bd^3n+ad^3\right)r^5+bd^3n+193\left(bd^3n+ad^3\right)r^4+ad^3-144\left(bd^3n+ad^3\right)r^3+58\left(bd^3n+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -(36*(b*d^3*n + a*d^3)*r^6 - 132*(b*d^3*n + a*d^3)*r^5 + b*d^3*n + 193*(b*d
^3*n + a*d^3)*r^4 + a*d^3 - 144*(b*d^3*n + a*d^3)*r^3 + 58*(b*d^3*n + a*d^3
)*r^2 - 12*(b*d^3*n + a*d^3)*r - (12*a*e^3*r^5 - b*e^3*n - 4*(b*e^3*n + 10*
a*e^3)*r^4 - a*e^3 + 3*(4*b*e^3*n + 17*a*e^3)*r^3 - (13*b*e^3*n + 31*a*e^3)
*r^2 + 3*(2*b*e^3*n + 3*a*e^3)*r + (12*b*e^3*r^5 - 40*b*e^3*r^4 + 51*b*e^3*
r^3 - 31*b*e^3*r^2 + 9*b*e^3*r - b*e^3)*log(c) + (12*b*e^3*n*r^5 - 40*b*e^3
*n*r^4 + 51*b*e^3*n*r^3 - 31*b*e^3*n*r^2 + 9*b*e^3*n*r - b*e^3*n)*log(x))*x
^(3*r) - 3*(18*a*d*e^2*r^5 - b*d*e^2*n - 3*(3*b*d*e^2*n + 19*a*d*e^2)*r^4 -
 a*d*e^2 + 4*(6*b*d*e^2*n + 17*a*d*e^2)*r^3 - 2*(11*b*d*e^2*n + 19*a*d*e^2)
*r^2 + 2*(4*b*d*e^2*n + 5*a*d*e^2)*r + (18*b*d*e^2*r^5 - 57*b*d*e^2*r^4 + 6
8*b*d*e^2*r^3 - 38*b*d*e^2*r^2 + 10*b*d*e^2*r - b*d*e^2)*log(c) + (18*b*d*e
^2*n*r^5 - 57*b*d*e^2*n*r^4 + 68*b*d*e^2*n*r^3 - 38*b*d*e^2*n*r^2 + 10*b*d*
e^2*n*r - b*d*e^2*n)*log(x))*x^(2*r) - 3*(36*a*d^2*e*r^5 - b*d^2*e*n - 12*(
3*b*d^2*e*n + 8*a*d^2*e)*r^4 - a*d^2*e + (60*b*d^2*e*n + 97*a*d^2*e)*r^3 -
(37*b*d^2*e*n + 47*a*d^2*e)*r^2 + (10*b*d^2*e*n + 11*a*d^2*e)*r + (36*b*d^2
*e*r^5 - 96*b*d^2*e*r^4 + 97*b*d^2*e*r^3 - 47*b*d^2*e*r^2 + 11*b*d^2*e*r -
b*d^2*e)*log(c) + (36*b*d^2*e*n*r^5 - 96*b*d^2*e*n*r^4 + 97*b*d^2*e*n*r^3 -
 47*b*d^2*e*n*r^2 + 11*b*d^2*e*n*r - b*d^2*e*n)*log(x))*x^r + (36*b*d^3*r^6
 - 132*b*d^3*r^5 + 193*b*d^3*r^4 - 144*b*d^3*r^3 + 58*b*d^3*r^2 - 12*b*d^3*
r + b*d^3)*log(c) + (36*b*d^3*n*r^6 - 132*b*d^3*n*r^5 + 193*b*d^3*n*r^4 - 1
44*b*d^3*n*r^3 + 58*b*d^3*n*r^2 - 12*b*d^3*n*r + b*d^3*n)*log(x))/((36*r^6
- 132*r^5 + 193*r^4 - 144*r^3 + 58*r^2 - 12*r + 1)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(ex^r+d\right)^3\left(b\log\left(cx^n\right)+a\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^2, x)
```

maple [C] time = 0.51, size = 4031, normalized size = 22.52

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d+e*x^r)^3*(b*ln(c*x^n)+a)/x^2,x)

[Out] -b*(-2*e^3*r^2*(x^r)^3-9*d*e^2*r^2*(x^r)^2+3*e^3*r*(x^r)^3+6*d^3*r^3-18*d^2*e*r^2*x^r+12*d*e^2*r*(x^r)^2-e^3*(x^r)^3-11*d^3*r^2+15*d^2*e*r*x^r-3*d*e^2*(x^r)^2+6*d^3*r-3*d^2*e*x^r-d^3)/x/(-1+3*r)/(2*r-1)/(r-1)*ln(x^n)-1/2*(-264*a*d^3*r^5+386*a*d^3*r^4-141*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+72*b*d^3*n*r^6-264*b*d^3*n*r^5+386*b*d^3*n*r^4+2*a*e^3*(x^r)^3+2*a*d^3+9*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-30*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+72*ln(c)*b*d^3*r^6-264*ln(c)*b*d^3*r^5+386*ln(c)*b*d^3*r^4-288*ln(c)*b*d^3*r^3+116*ln(c)*b*d^3*r^2-24*ln(c)*b*d^3*r+72*a*d^3*r^6+2*b*d^3*n-24*a*e^3*r^5*(x^r)^3+80*a*e^3*r^4*(x^r)^3+2*ln(c)*b*e^3*(x^r)^3+2*b*e^3*n*(x^r)^3-102*a*e^3*r^3*(x^r)^3+62*a*e^3*r^2*(x^r)^3-18*a*e^3*r*(x^r)^3+6*a*d*e^2*(x^r)^2+6*a*d^2*e*x^r+2*b*d^3*ln(c)-288*b*d^3*n*r^3+116*b*d^3*n*r^2-24*b*d^3*n*r-132*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2-288*a*d^3*r^3+116*a*d^3*r^2-24*a*d^3*r+132*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3-60*ln(c)*b*d*e^2*r*(x^r)^2-582*ln(c)*b*d^2*e*r^3*x^r+282*ln(c)*b*d^2*e*r^2*x^r-66*ln(c)*b*d^2*e*r*x^r-408*ln(c)*b*d*e^2*r^3*(x^r)^2+228*ln(c)*b*d*e^2*r^2*(x^r)^2-60*b*d^2*e*n*r*x^r+132*b*d*e^2*n*r^2*(x^r)^2+222*b*d^2*e*n*r^2*x^r+141*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-291*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-51*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-51*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+144*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+58*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+36*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2+58*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)-30*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+6*b*d^2*e*n*x^r-408*a*d*e^2*r^3*(x^r)^2+228*a*d*e^2*r^2*(x^r)^2-60*a*d*e^2*r*(x^r)^2-582*a*d^2*e*r^3*x^r+282*a*d^2*e*r^2*x^r+40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+3*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+132*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d^3*csgn(I*c*x^n)^3-12*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)+12*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3-132*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)-144*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)+114*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-3*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-288*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+141*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-3*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r-204*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-204*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-291*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-24*b*e^3*n*r^3*(x^r)^3-108*a*d*e^2*r^5*(x^r)^2+342*a*d*e^2*r^4*(x^r)^2-216*a*d^2*e*r^5*x^r+576*a*d^2*e*r^4*x^r+26*b*e^3*n*r^2*(x^r)^3-12*b*e^3*n*r*(x^r)^3+6*b*d*e^2*n*(x^r)^2-33*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-33*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+8*b*e^3*n*r^4*(x^r)^3-66*a*d^2*e*r*x^r+6*ln(c)*b*d^2*e*x^r+6*ln(c)*b*d*e^2*(x^r)^2-24*ln(c)*b*e^3*r^5*(x^r)^3+80*ln(c)*b*e^3*r^4*(x^r)^3-102*ln(c)*b*e^3*r^3*(x^r)^3+62*ln(c)*b*e^3*r^2*(x^r)^3-18*ln(c)*b*e^3*r*(x^r)^3-9*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+30*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+204*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2+54*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2+108*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r-193*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3+51*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-108*I*P

```
i*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r+12*I*Pi*b*e^3*r^5*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*(x^r)^3-193*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2+12*I*Pi*b*d^3*r*csg
n(I*c*x^n)^3+144*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3+30*I*Pi*b*d*e^2*r*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-40*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^
3+193*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+193*I*Pi*b*d^3*r^4*csgn(I*
c*x^n)^2*csgn(I*c)+40*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-144*
I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*b*d^3*r*csgn(I*x^n)*csgn
(I*c*x^n)^2-48*b*d*e^2*n*r*(x^r)^2-108*ln(c)*b*d*e^2*r^5*(x^r)^2+342*ln(c)*
b*d*e^2*r^4*(x^r)^2-216*ln(c)*b*d^2*e*r^5*x^r+576*ln(c)*b*d^2*e*r^4*x^r+54*
b*d*e^2*n*r^4*(x^r)^2-144*b*d*e^2*n*r^3*(x^r)^2+216*b*d^2*e*n*r^4*x^r-360*b
*d^2*e*n*r^3*x^r+291*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r-9*I*Pi*b*e^3*r*cs
gn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+36*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*
c)-31*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+114*I*Pi*b
*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+9*I*Pi*b*e^3*r*csgn(I*c*x^n)
^3*(x^r)^3+51*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+171*I*Pi*b*d*e^2*r^4*c
sgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+288*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*
x^n)^2*x^r-114*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2
+33*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+291*I*Pi*b*d^2*e
*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+204*I*Pi*b*d*e^2*r^3*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-3*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-3
1*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3-3*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r
-54*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+33*I*Pi*b*d^2*e*r*cs
gn(I*c*x^n)^3*x^r+12*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3*I*P
i*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+3*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*cs
gn(I*c)*x^r+31*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-58*I*Pi*b
*d^3*r^2*csgn(I*c*x^n)^3-I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3-36*I*Pi*b*d^3*r
^6*csgn(I*c*x^n)^3-12*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-12
*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+31*I*Pi*b*e^3*r^2*csgn(I*
c*x^n)^2*csgn(I*c)*(x^r)^3-114*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-141
*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r+3*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I
*c)*(x^r)^2-36*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-58*I*Pi*b
*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c))/(-1+3*r)^2/x/(2*r-1)^2/(r-1)^
2
```

maxima [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-2>0)', see `assume?` for more det
ails)Is r-2 equal to -1?
```

mupad [F]   time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d + e\,x^r)^3\ (a + b\,\ln(c\,x^n))}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^2,x)
```

```
[Out] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^2, x)
```

sympy [A] time = 62.80, size = 314, normalized size = 1.75

$$-\frac{ad^3}{x}+3ad^2e\left(\begin{cases}\frac{x^r}{rx-x} & \text{for } r\neq 1\\ \log(x) & \text{otherwise}\end{cases}\right)+3ade^2\left(\begin{cases}\frac{x^{2r}}{2rx-x} & \text{for } r\neq \frac{1}{2}\\ \log(x) & \text{otherwise}\end{cases}\right)+ae^3\left(\begin{cases}\frac{x^{3r}}{3rx-x} & \text{for } r\neq \frac{1}{3}\\ \log(x) & \text{otherwise}\end{cases}\right)-\frac{bd^3n}{x}-\frac{bd^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] -a*d**3/x + 3*a*d**2*e*Piecewise((x**r/(r*x - x), Ne(r, 1)), (log(x), True)
) + 3*a*d*e**2*Piecewise((x**(2*r)/(2*r*x - x), Ne(r, 1/2)), (log(x), True)
) + a*e**3*Piecewise((x**(3*r)/(3*r*x - x), Ne(r, 1/3)), (log(x), True)) -
b*d**3*n/x - b*d**3*log(c*x**n)/x - 3*b*d**2*e*n*Piecewise((Piecewise((x**r
/(r*x - x), Ne(r, 1)), (log(x), True))/(r - 1), (r > -oo) & (r < oo) & Ne(r
, 1)), (log(x)**2/2, True)) + 3*b*d**2*e*Piecewise((x**(r - 1)/(r - 1), Ne(
r - 2, -1)), (log(x), True))*log(c*x**n) - 3*b*d*e**2*n*Piecewise((Piecewis
e((x**(2*r)/(2*r*x - x), Ne(r, 1/2)), (log(x), True))/(2*r - 1), (r > -oo)
& (r < oo) & Ne(r, 1/2)), (log(x)**2/2, True)) + 3*b*d*e**2*Piecewise((x**(
2*r - 1)/(2*r - 1), Ne(2*r - 2, -1)), (log(x), True))*log(c*x**n) - b*e**3*
n*Piecewise((Piecewise((x**(3*r)/(3*r*x - x), Ne(r, 1/3)), (log(x), True))/
(3*r - 1), (r > -oo) & (r < oo) & Ne(r, 1/3)), (log(x)**2/2, True)) + b*e**
3*Piecewise((x**(3*r - 1)/(3*r - 1), Ne(3*r - 2, -1)), (log(x), True))*log(
c*x**n)
```

3.402 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=191

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{3d^2ex^{r-3}\left(a+b\log\left(cx^n\right)\right)}{3-r}-\frac{3de^2x^{2r-3}\left(a+b\log\left(cx^n\right)\right)}{3-2r}-\frac{e^3x^{-3(1-r)}\left(a+b\log\left(cx^n\right)\right)}{3(1-r)}-\frac{bd^3n}{9x^3}-$$

```
[Out] -1/9*b*d^3*n/x^3-1/9*b*e^3*n/(1-r)^2/(x^(3-3*r))-3*b*d^2*e*n*x^(-3+r)/(3-r)
^2-3*b*d*e^2*n*x^(-3+2*r)/(3-2*r)^2-1/3*d^3*(a+b*ln(c*x^n))/x^3-1/3*e^3*(a+
b*ln(c*x^n))/(1-r)/(x^(3-3*r))-3*d^2*e*x^(-3+r)*(a+b*ln(c*x^n))/(3-r)-3*d*e
^2*x^(-3+2*r)*(a+b*ln(c*x^n))/(3-2*r)
```

Rubi [A] time = 0.39, antiderivative size = 160, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{3}\left(\frac{9d^2ex^{r-3}}{3-r}+\frac{d^3}{x^3}+\frac{9de^2x^{2r-3}}{3-2r}+\frac{e^3x^{-3(1-r)}}{1-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r-3}}{(3-r)^2}-\frac{bd^3n}{9x^3}-\frac{3bde^2nx^{2r-3}}{(3-2r)^2}-\frac{be^3nx^{-3(1-r)}}{9(1-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^3*n)/(9*x^3) - (b*e^3*n)/(9*(1 - r)^2*x^(3*(1 - r))) - (3*b*d^2*e*n*x
^(-3 + r))/(3 - r)^2 - (3*b*d*e^2*n*x^(-3 + 2*r))/(3 - 2*r)^2 - ((d^3/x^3 +
 e^3/((1 - r)*x^(3*(1 - r))) + (9*d^2*e*x^(-3 + r))/(3 - r) + (9*d*e^2*x^(-
3 + 2*r))/(3 - 2*r))*(a + b*Log[c*x^n]))/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^3\left(a+b\log\left(cx^n\right)\right)}{x^4}\,dx = -\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{e^3x^{-3(1-r)}}{1-r}+\frac{9d^2ex^{-3+r}}{3-r}+\frac{9de^2x^{-3+2r}}{3-2r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int$$

$$= -\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{e^3x^{-3(1-r)}}{1-r}+\frac{9d^2ex^{-3+r}}{3-r}+\frac{9de^2x^{-3+2r}}{3-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}(bn)$$

$$= -\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{e^3x^{-3(1-r)}}{1-r}+\frac{9d^2ex^{-3+r}}{3-r}+\frac{9de^2x^{-3+2r}}{3-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}(bn)$$

$$= -\frac{bd^3n}{9x^3}-\frac{be^3nx^{-3(1-r)}}{9(1-r)^2}-\frac{3bd^2enx^{-3+r}}{(3-r)^2}-\frac{3bde^2nx^{-3+2r}}{(3-2r)^2}-\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{e^3x^{-3(1-r}}{1-r}\right.$$

Mathematica [A] time = 0.39, size = 180, normalized size = 0.94

$$\frac{3a\left(-d^3+\frac{9d^2ex^r}{r-3}+\frac{9de^2x^{2r}}{2r-3}+\frac{e^3x^{3r}}{r-1}\right)+3b\log\left(cx^n\right)\left(-d^3+\frac{9d^2ex^r}{r-3}+\frac{9de^2x^{2r}}{2r-3}+\frac{e^3x^{3r}}{r-1}\right)+bn\left(-d^3-\frac{27d^2ex^r}{(r-3)^2}-\frac{27de^2x^{2r}}{(3-2r)^2}-\right.}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] (b*n*(-d^3 - (27*d^2*e*x^r)/(-3 + r)^2 - (27*d*e^2*x^(2*r))/(3 - 2*r)^2 - (
e^3*x^(3*r))/(-1 + r)^2) + 3*a*(-d^3 + (9*d^2*e*x^r)/(-3 + r) + (9*d*e^2*x^
(2*r))/(-3 + 2*r) + (e^3*x^(3*r))/(-1 + r)) + 3*b*(-d^3 + (9*d^2*e*x^r)/(-3
 + r) + (9*d*e^2*x^(2*r))/(-3 + 2*r) + (e^3*x^(3*r))/(-1 + r))*Log[c*x^n])/
(9*x^3)
```

fricas [B] time = 0.48, size = 980, normalized size = 5.13

$$-\frac{4\left(bd^3n+3\,ad^3\right)r^6-44\left(bd^3n+3\,ad^3\right)r^5+81\,bd^3n+193\left(bd^3n+3\,ad^3\right)r^4+243\,ad^3-432\left(bd^3n+3\,ad^3\right)r^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(4*(b*d^3*n + 3*a*d^3)*r^6 - 44*(b*d^3*n + 3*a*d^3)*r^5 + 81*b*d^3*n +
 193*(b*d^3*n + 3*a*d^3)*r^4 + 243*a*d^3 - 432*(b*d^3*n + 3*a*d^3)*r^3 + 52
2*(b*d^3*n + 3*a*d^3)*r^2 - 324*(b*d^3*n + 3*a*d^3)*r - (12*a*e^3*r^5 - 81*
b*e^3*n - 4*(b*e^3*n + 30*a*e^3)*r^4 - 243*a*e^3 + 9*(4*b*e^3*n + 51*a*e^3)
*r^3 - 9*(13*b*e^3*n + 93*a*e^3)*r^2 + 81*(2*b*e^3*n + 9*a*e^3)*r + 3*(4*b*
e^3*r^5 - 40*b*e^3*r^4 + 153*b*e^3*r^3 - 279*b*e^3*r^2 + 243*b*e^3*r - 81*b
*e^3)*log(c) + 3*(4*b*e^3*n*r^5 - 40*b*e^3*n*r^4 + 153*b*e^3*n*r^3 - 279*b*
e^3*n*r^2 + 243*b*e^3*n*r - 81*b*e^3*n)*log(x))*x^(3*r) - 27*(2*a*d*e^2*r^5
 - 9*b*d*e^2*n - (b*d*e^2*n + 19*a*d*e^2)*r^4 - 27*a*d*e^2 + 4*(2*b*d*e^2*n
 + 17*a*d*e^2)*r^3 - 2*(11*b*d*e^2*n + 57*a*d*e^2)*r^2 + 6*(4*b*d*e^2*n + 1
5*a*d*e^2)*r + (2*b*d*e^2*r^5 - 19*b*d*e^2*r^4 + 68*b*d*e^2*r^3 - 114*b*d*e
^2*r^2 + 90*b*d*e^2*r - 27*b*d*e^2)*log(c) + (2*b*d*e^2*n*r^5 - 19*b*d*e^2*
n*r^4 + 68*b*d*e^2*n*r^3 - 114*b*d*e^2*n*r^2 + 90*b*d*e^2*n*r - 27*b*d*e^2*
n)*log(x))*x^(2*r) - 27*(4*a*d^2*e*r^5 - 9*b*d^2*e*n - 4*(b*d^2*e*n + 8*a*d
^2*e)*r^4 - 27*a*d^2*e + (20*b*d^2*e*n + 97*a*d^2*e)*r^3 - (37*b*d^2*e*n +
141*a*d^2*e)*r^2 + 3*(10*b*d^2*e*n + 33*a*d^2*e)*r + (4*b*d^2*e*r^5 - 32*b*
d^2*e*r^4 + 97*b*d^2*e*r^3 - 141*b*d^2*e*r^2 + 99*b*d^2*e*r - 27*b*d^2*e)*l
og(c) + (4*b*d^2*e*n*r^5 - 32*b*d^2*e*n*r^4 + 97*b*d^2*e*n*r^3 - 141*b*d^2*
e*n*r^2 + 99*b*d^2*e*n*r - 27*b*d^2*e*n)*log(x))*x^r + 3*(4*b*d^3*r^6 - 44*
b*d^3*r^5 + 193*b*d^3*r^4 - 432*b*d^3*r^3 + 522*b*d^3*r^2 - 324*b*d^3*r + 8
1*b*d^3)*log(c) + 3*(4*b*d^3*n*r^6 - 44*b*d^3*n*r^5 + 193*b*d^3*n*r^4 - 432
```

```
*b*d^3*n*r^3 + 522*b*d^3*n*r^2 - 324*b*d^3*n*r + 81*b*d^3*n)*log(x))/((4*r^
6 - 44*r^5 + 193*r^4 - 432*r^3 + 522*r^2 - 324*r + 81)*x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r + d)^3 \left(b \log \left(cx^n\right) + a\right)}{x^4} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^4, x)
```

maple [C] time = 0.49, size = 4027, normalized size = 21.08

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(b*ln(c*x^n)+a)/x^4,x)
```

```
[Out] -1/3*b*(-2*e^3*r^2*(x^r)^3-9*d*e^2*r^2*(x^r)^2+9*e^3*r*(x^r)^3+2*d^3*r^3-18
*d^2*e*r^2*x^r+36*d*e^2*r*(x^r)^2-9*e^3*(x^r)^3-11*d^3*r^2+45*d^2*e*r*x^r-2
7*d*e^2*(x^r)^2+18*d^3*r-27*d^2*e*x^r-9*d^3)/x^3/(r-1)/(2*r-3)/(r-3)*ln(x^n
)-1/18*(3078*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+3078*I*Pi
*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+3807*I*Pi*b*d^2*e*r^2*csgn(I
*x^n)*csgn(I*c*x^n)^2*x^r-120*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*(x^r)^3+513*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+513*
I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+864*I*Pi*b*d^2*e*r^4*csg
n(I*x^n)*csgn(I*c*x^n)^2*x^r-729*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*x^r-264*a*d^3*r^5+1158*a*d^3*r^4+8*b*d^3*n*r^6-88*b*d^3*n*r^5+386*b*
d^3*n*r^4+486*a*e^3*(x^r)^3+486*a*d^3+24*ln(c)*b*d^3*r^6-264*ln(c)*b*d^3*r^
5+1158*ln(c)*b*d^3*r^4-2592*ln(c)*b*d^3*r^3+3132*ln(c)*b*d^3*r^2-1944*ln(c)
*b*d^3*r+24*a*d^3*r^6+162*b*d^3*n-24*a*e^3*r^5*(x^r)^3+240*a*e^3*r^4*(x^r)^
3+486*ln(c)*b*e^3*(x^r)^3+162*b*e^3*n*(x^r)^3-918*a*e^3*r^3*(x^r)^3+1674*a*
e^3*r^2*(x^r)^3-1458*a*e^3*r*(x^r)^3+1458*a*d*e^2*(x^r)^2+1458*a*d^2*e*x^r+
486*b*d^3*ln(c)-864*b*d^3*n*r^3+1044*b*d^3*n*r^2-648*b*d^3*n*r-132*I*Pi*b*d
^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2+729*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3
-2592*a*d^3*r^3+3132*a*d^3*r^2-1944*a*d^3*r+132*I*Pi*b*d^3*r^5*csgn(I*c*x^n
)^3+1296*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3-4860*ln(c)*b*d*e^2*r*(x^r)^2-5238*l
n(c)*b*d^2*e*r^3*x^r+7614*ln(c)*b*d^2*e*r^2*x^r-5346*ln(c)*b*d^2*e*r*x^r-36
72*ln(c)*b*d*e^2*r^3*(x^r)^2+6156*ln(c)*b*d*e^2*r^2*(x^r)^2-1620*b*d^2*e*n*
r*x^r+1188*b*d*e^2*n*r^2*(x^r)^2+1998*b*d^2*e*n*r^2*x^r+1566*I*Pi*b*d^3*r^2
*csgn(I*c*x^n)^2*csgn(I*c)+12*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-729*
I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-1566*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3-24
3*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+3807*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*
csgn(I*c)*x^r-2430*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+972*I
*Pi*b*d^3*r*csgn(I*c*x^n)^3+579*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+
579*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)+243*I*Pi*b*e^3*csgn(I*c*x^n)^2
*csgn(I*c)*(x^r)^3+1566*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+2430*I*P
i*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+2673*I*Pi*b*d^2*e*r
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2619*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)*x^r-1296*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)-2
43*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+12*I*Pi*b*d^3*r^6*csgn(I*
x^n)*csgn(I*c*x^n)^2+243*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+243*I*Pi*b*
d^3*csgn(I*c*x^n)^2*csgn(I*c)-12*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3-579*I*Pi*b*
d^3*r^4*csgn(I*c*x^n)^3+486*b*d^2*e*n*x^r-3672*a*d*e^2*r^3*(x^r)^2+6156*a*d
*e^2*r^2*(x^r)^2-4860*a*d*e^2*r*(x^r)^2-5238*a*d^2*e*r^3*x^r+7614*a*d^2*e*r
^2*x^r-243*I*Pi*b*d^3*csgn(I*c*x^n)^3+54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*(x^r)^2+108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*c
```

```
sgn(I*c)*x^r-729*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-5
4*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+864*I*Pi*b*d^2*e*r^4
*csgn(I*c*x^n)^2*csgn(I*c)*x^r-837*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*(x^r)^3-579*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-5
13*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2+972*I*Pi*b*d^3*r*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)+132*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+459*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-1836*I*Pi*
b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+12*I*Pi*b*e^3*r^5*csgn(I*c*
x^n)^3*(x^r)^3-132*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)+1836*I*Pi*b*d*e
^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-2619*I*Pi*b*d^2*e*r^3*cs
gn(I*x^n)*csgn(I*c*x^n)^2*x^r+729*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*(x^r)^3-2673*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-2673*I*
Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+837*I*Pi*b*e^3*r^2*csgn(I*x^n)*c
sgn(I*c*x^n)^2*(x^r)^3+120*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3
-2619*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-1836*I*Pi*b*d*e^2*r^3*
csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-459*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x
^n)^2*(x^r)^3-459*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+1296*I*P
i*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-72*b*e^3*n*r^3*(x^r)^3-108*
a*d*e^2*r^5*(x^r)^2+1026*a*d*e^2*r^4*(x^r)^2-216*a*d^2*e*r^5*x^r+1728*a*d^2
*e*r^4*x^r+234*b*e^3*n*r^2*(x^r)^3-324*b*e^3*n*r*(x^r)^3+486*b*d*e^2*n*(x^r
)^2-864*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-513*I*Pi*b
*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-3078*I*Pi*b*d*e^2*r^
2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+8*b*e^3*n*r^4*(x^r)^3-5346*a*
d^2*e*r*x^r+1458*ln(c)*b*d^2*e*x^r+1458*ln(c)*b*d*e^2*(x^r)^2-24*ln(c)*b*e^
3*r^5*(x^r)^3+240*ln(c)*b*e^3*r^4*(x^r)^3-918*ln(c)*b*e^3*r^3*(x^r)^3+1674*
ln(c)*b*e^3*r^2*(x^r)^3-1458*ln(c)*b*e^3*r*(x^r)^3+54*I*Pi*b*d*e^2*r^5*csgn
(I*c*x^n)^3*(x^r)^2+108*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r+2673*I*Pi*b*d^
2*e*r*csgn(I*c*x^n)^3*x^r-108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*
x^r-108*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r+12*I*Pi*b*e^3*r^5*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-729*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*
csgn(I*c)*(x^r)^3-1566*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+8
37*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-1296*I*Pi*b*d^3*r^3*csg
n(I*x^n)*csgn(I*c*x^n)^2-972*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2-972*I
*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)-3078*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3
*(x^r)^2-3807*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r+120*I*Pi*b*e^3*r^4*csgn(
I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-864*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+459
*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3-1296*b*d*e^2*n*r*(x^r)^2-108*ln(c)*
b*d*e^2*r^5*(x^r)^2+1026*ln(c)*b*d*e^2*r^4*(x^r)^2-216*ln(c)*b*d^2*e*r^5*x^
r+1728*ln(c)*b*d^2*e*r^4*x^r+54*b*d*e^2*n*r^4*(x^r)^2-432*b*d*e^2*n*r^3*(x^
r)^2+216*b*d^2*e*n*r^4*x^r-1080*b*d^2*e*n*r^3*x^r-729*I*Pi*b*e^3*r*csgn(I*x
^n)*csgn(I*c*x^n)^2*(x^r)^3+2430*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+183
6*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-2430*I*Pi*b*d*e^2*r*csgn(I*c*x^n
)^2*csgn(I*c)*(x^r)^2-54*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2
-243*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+729*I*Pi*b*d*e^
2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+729*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c
*x^n)^2*x^r+729*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2619*I*Pi*b*d^2*
e*r^3*csgn(I*c*x^n)^3*x^r-12*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^
r)^3-12*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-3807*I*Pi*b*d^2*e*
r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+729*I*Pi*b*d*e^2*csgn(I*c*x^n)^
2*csgn(I*c)*(x^r)^2-12*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2
43*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-837*I*Pi*b*e^3*r^2*csgn(I
*c*x^n)^3*(x^r)^3-729*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r-120*I*Pi*b*e^3*r^4*c
sgn(I*c*x^n)^3*(x^r)^3)/(r-1)^2/x^3/(2*r-3)^2/(r-3)^2
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-4>0)', see `assume?` for more det
ails)Is r-4 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^r)^3\,(a+b\,\ln(c\,x^n))}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^4,x)
```

```
[Out] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^4, x)
```

sympy [A] time = 178.89, size = 350, normalized size = 1.83

$$-\frac{ad^3}{3x^3}+3ad^2e\left(\begin{cases}\frac{x^r}{rx^3-3x^3} & \text{for } r\neq 3\\ \log(x) & \text{otherwise}\end{cases}\right)+3ade^2\left(\begin{cases}\frac{x^{2r}}{2rx^3-3x^3} & \text{for } r\neq \frac{3}{2}\\ \log(x) & \text{otherwise}\end{cases}\right)+ae^3\left(\begin{cases}\frac{x^{3r}}{3rx^3-3x^3} & \text{for } r\neq 1\\ \log(x) & \text{otherwise}\end{cases}\right)-\frac{bd^3n}{9x^3}-\frac{bd^3 \mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d**3/(3*x**3) + 3*a*d**2*e*Piecewise((x**r/(r*x**3 - 3*x**3), Ne(r, 3)),
 (log(x), True)) + 3*a*d*e**2*Piecewise((x**(2*r)/(2*r*x**3 - 3*x**3), Ne(r
, 3/2)), (log(x), True)) + a*e**3*Piecewise((x**(3*r)/(3*r*x**3 - 3*x**3),
Ne(r, 1)), (log(x), True)) - b*d**3*n/(9*x**3) - b*d**3*log(c*x**n)/(3*x**3
) - 3*b*d**2*e*n*Piecewise((Piecewise((x**r/(r*x**3 - 3*x**3), Ne(r, 3)), (
log(x), True))/(r - 3), (r > -oo) & (r < oo) & Ne(r, 3)), (log(x)**2/2, Tru
e)) + 3*b*d**2*e*Piecewise((x**(r - 3)/(r - 3), Ne(r - 4, -1)), (log(x), Tr
ue))*log(c*x**n) - 3*b*d*e**2*n*Piecewise((Piecewise((x**(2*r)/(2*r*x**3 -
3*x**3), Ne(r, 3/2)), (log(x), True))/(2*r - 3), (r > -oo) & (r < oo) & Ne(
r, 3/2)), (log(x)**2/2, True)) + 3*b*d*e**2*Piecewise((x**(2*r - 3)/(2*r -
3), Ne(2*r - 4, -1)), (log(x), True))*log(c*x**n) - b*e**3*n*Piecewise((Pie
cewise((x**(3*r)/(3*r*x**3 - 3*x**3), Ne(r, 1)), (log(x), True))/(3*r - 3),
 (r > -oo) & (r < oo) & Ne(r, 1)), (log(x)**2/2, True)) + b*e**3*Piecewise(
(x**(3*r - 3)/(3*r - 3), Ne(3*r - 4, -1)), (log(x), True))*log(c*x**n)
```

3.403 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=183

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{3d^2ex^{r-5}\left(a+b\log\left(cx^n\right)\right)}{5-r}-\frac{3de^2x^{2r-5}\left(a+b\log\left(cx^n\right)\right)}{5-2r}-\frac{e^3x^{3r-5}\left(a+b\log\left(cx^n\right)\right)}{5-3r}-\frac{bd^3n}{25x^5}$$

```
[Out] -1/25*b*d^3*n/x^5-3*b*d^2*e*n*x^(-5+r)/(5-r)^2-3*b*d*e^2*n*x^(-5+2*r)/(5-2*
r)^2-b*e^3*n*x^(-5+3*r)/(5-3*r)^2-1/5*d^3*(a+b*ln(c*x^n))/x^5-3*d^2*e*x^(-5
+r)*(a+b*ln(c*x^n))/(5-r)-3*d*e^2*x^(-5+2*r)*(a+b*ln(c*x^n))/(5-2*r)-e^3*x^
(-5+3*r)*(a+b*ln(c*x^n))/(5-3*r)
```

Rubi [A] time = 0.41, antiderivative size = 155, normalized size of antiderivative = 0.85, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{5}\left(\frac{15d^2ex^{r-5}}{5-r}+\frac{d^3}{x^5}+\frac{15de^2x^{2r-5}}{5-2r}+\frac{5e^3x^{3r-5}}{5-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r-5}}{(5-r)^2}-\frac{bd^3n}{25x^5}-\frac{3bde^2nx^{2r-5}}{(5-2r)^2}-\frac{be^3nx^{3r-5}}{(5-3r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d^3*n)/(25*x^5) - (3*b*d^2*e*n*x^(-5 + r))/(5 - r)^2 - (3*b*d*e^2*n*x^(
-5 + 2*r))/(5 - 2*r)^2 - (b*e^3*n*x^(-5 + 3*r))/(5 - 3*r)^2 - ((d^3/x^5 + (
15*d^2*e*x^(-5 + r))/(5 - r) + (15*d*e^2*x^(-5 + 2*r))/(5 - 2*r) + (5*e^3*x
^(-5 + 3*r))/(5 - 3*r))*(a + b*Log[c*x^n]))/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^3\left(a+b\log\left(cx^n\right)\right)}{x^6}\,dx = -\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{15d^2ex^{-5+r}}{5-r}+\frac{15de^2x^{-5+2r}}{5-2r}+\frac{5e^3x^{-5+3r}}{5-3r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int$$

$$= -\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{15d^2ex^{-5+r}}{5-r}+\frac{15de^2x^{-5+2r}}{5-2r}+\frac{5e^3x^{-5+3r}}{5-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{5}(bn)$$

$$= -\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{15d^2ex^{-5+r}}{5-r}+\frac{15de^2x^{-5+2r}}{5-2r}+\frac{5e^3x^{-5+3r}}{5-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{5}(bn)$$

$$= -\frac{bd^3n}{25x^5}-\frac{3bd^2enx^{-5+r}}{(5-r)^2}-\frac{3bde^2nx^{-5+2r}}{(5-2r)^2}-\frac{be^3nx^{-5+3r}}{(5-3r)^2}-\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{15d^2ex^{-5+r}}{5-r}+\right.$$

Mathematica [A] time = 0.42, size = 187, normalized size = 1.02

$$\frac{a\left(-5d^3+\frac{75d^2ex^r}{r-5}+\frac{75de^2x^{2r}}{2r-5}+\frac{25e^3x^{3r}}{3r-5}\right)+5b\log\left(cx^n\right)\left(-d^3+\frac{15d^2ex^r}{r-5}+\frac{15de^2x^{2r}}{2r-5}+\frac{5e^3x^{3r}}{3r-5}\right)+bn\left(-d^3-\frac{75d^2ex^r}{(r-5)^2}-\frac{75de^2x^2}{(5-2r)^2}\right.}{25x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] (b*n*(-d^3 - (75*d^2*e*x^r)/(-5 + r)^2 - (75*d*e^2*x^(2*r))/(5 - 2*r)^2 - (
25*e^3*x^(3*r))/(5 - 3*r)^2) + a*(-5*d^3 + (75*d^2*e*x^r)/(-5 + r) + (75*d*
e^2*x^(2*r))/(-5 + 2*r) + (25*e^3*x^(3*r))/(-5 + 3*r)) + 5*b*(-d^3 + (15*d^
2*e*x^r)/(-5 + r) + (15*d*e^2*x^(2*r))/(-5 + 2*r) + (5*e^3*x^(3*r))/(-5 + 3
*r))*Log[c*x^n])/(25*x^5)
```

fricas [B] time = 0.44, size = 981, normalized size = 5.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/25*(36*(b*d^3*n + 5*a*d^3)*r^6 - 660*(b*d^3*n + 5*a*d^3)*r^5 + 15625*b*d
^3*n + 4825*(b*d^3*n + 5*a*d^3)*r^4 + 78125*a*d^3 - 18000*(b*d^3*n + 5*a*d^
3)*r^3 + 36250*(b*d^3*n + 5*a*d^3)*r^2 - 37500*(b*d^3*n + 5*a*d^3)*r - 25*(
12*a*e^3*r^5 - 625*b*e^3*n - 4*(b*e^3*n + 50*a*e^3)*r^4 - 3125*a*e^3 + 15*(
4*b*e^3*n + 85*a*e^3)*r^3 - 25*(13*b*e^3*n + 155*a*e^3)*r^2 + 375*(2*b*e^3*
n + 15*a*e^3)*r + (12*b*e^3*r^5 - 200*b*e^3*r^4 + 1275*b*e^3*r^3 - 3875*b*e
^3*r^2 + 5625*b*e^3*r - 3125*b*e^3)*log(c) + (12*b*e^3*n*r^5 - 200*b*e^3*n*
r^4 + 1275*b*e^3*n*r^3 - 3875*b*e^3*n*r^2 + 5625*b*e^3*n*r - 3125*b*e^3*n)*
log(x))*x^(3*r) - 75*(18*a*d*e^2*r^5 - 625*b*d*e^2*n - 3*(3*b*d*e^2*n + 95*
a*d*e^2)*r^4 - 3125*a*d*e^2 + 20*(6*b*d*e^2*n + 85*a*d*e^2)*r^3 - 50*(11*b*
d*e^2*n + 95*a*d*e^2)*r^2 + 250*(4*b*d*e^2*n + 25*a*d*e^2)*r + (18*b*d*e^2*
r^5 - 285*b*d*e^2*r^4 + 1700*b*d*e^2*r^3 - 4750*b*d*e^2*r^2 + 6250*b*d*e^2*
r - 3125*b*d*e^2)*log(c) + (18*b*d*e^2*n*r^5 - 285*b*d*e^2*n*r^4 + 1700*b*d
*e^2*n*r^3 - 4750*b*d*e^2*n*r^2 + 6250*b*d*e^2*n*r - 3125*b*d*e^2*n)*log(x)
)*x^(2*r) - 75*(36*a*d^2*e*r^5 - 625*b*d^2*e*n - 12*(3*b*d^2*e*n + 40*a*d^2
*e)*r^4 - 3125*a*d^2*e + 25*(12*b*d^2*e*n + 97*a*d^2*e)*r^3 - 25*(37*b*d^2*
e*n + 235*a*d^2*e)*r^2 + 625*(2*b*d^2*e*n + 11*a*d^2*e)*r + (36*b*d^2*e*r^5
 - 480*b*d^2*e*r^4 + 2425*b*d^2*e*r^3 - 5875*b*d^2*e*r^2 + 6875*b*d^2*e*r -
 3125*b*d^2*e)*log(c) + (36*b*d^2*e*n*r^5 - 480*b*d^2*e*n*r^4 + 2425*b*d^2*
e*n*r^3 - 5875*b*d^2*e*n*r^2 + 6875*b*d^2*e*n*r - 3125*b*d^2*e*n)*log(x))*x
^r + 5*(36*b*d^3*r^6 - 660*b*d^3*r^5 + 4825*b*d^3*r^4 - 18000*b*d^3*r^3 + 3
6250*b*d^3*r^2 - 37500*b*d^3*r + 15625*b*d^3)*log(c) + 5*(36*b*d^3*n*r^6 -
660*b*d^3*n*r^5 + 4825*b*d^3*n*r^4 - 18000*b*d^3*n*r^3 + 36250*b*d^3*n*r^2
```

```
- 37500*b*d^3*n*r + 15625*b*d^3*n)*log(x))/((36*r^6 - 660*r^5 + 4825*r^4 -
18000*r^3 + 36250*r^2 - 37500*r + 15625)*x^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r+d)^3(b\log(cx^n)+a)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^6, x)
```

maple [C] time = 0.52, size = 4031, normalized size = 22.03

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(b*ln(c*x^n)+a)/x^6,x)
```

```
[Out] -1/5*b*(-10*e^3*r^2*(x^r)^3-45*d*e^2*r^2*(x^r)^2+75*e^3*r*(x^r)^3+6*d^3*r^3
-90*d^2*e*r^2*x^r+300*d*e^2*r*(x^r)^2-125*e^3*(x^r)^3-55*d^3*r^2+375*d^2*e*
r*x^r-375*d*e^2*(x^r)^2+150*d^3*r-375*d^2*e*x^r-125*d^3)/x^5/(-5+3*r)/(2*r-
5)/(r-5)*ln(x^n)-1/50*(440625*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^
r-234375*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+36000*I*P
i*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r-96875*I*Pi*b*e^3*r^2*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+356250*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(
I*c*x^n)^2*(x^r)^2+356250*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^
2-6600*a*d^3*r^5+48250*a*d^3*r^4+3300*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)-181875*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+14062
5*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+72*b*d^3*n*r^6-1
320*b*d^3*n*r^5+9650*b*d^3*n*r^4+156250*a*e^3*(x^r)^3+156250*a*d^3+360*ln(c
)*b*d^3*r^6-6600*ln(c)*b*d^3*r^5+48250*ln(c)*b*d^3*r^4-180000*ln(c)*b*d^3*r
^3+362500*ln(c)*b*d^3*r^2-375000*ln(c)*b*d^3*r+360*a*d^3*r^6+31250*b*d^3*n+
180*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2+181250*I*Pi*b*d^3*r^2*csgn(I
*c*x^n)^2*csgn(I*c)-600*a*e^3*r^5*(x^r)^3+10000*a*e^3*r^4*(x^r)^3+156250*ln
(c)*b*e^3*(x^r)^3+31250*b*e^3*n*(x^r)^3-63750*a*e^3*r^3*(x^r)^3+193750*a*e^
3*r^2*(x^r)^3-281250*a*e^3*r*(x^r)^3+468750*a*d*e^2*(x^r)^2+468750*a*d^2*e*
x^r-187500*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)+156250*b*d^3*ln(c)-36000*
b*d^3*n*r^3+72500*b*d^3*n*r^2-75000*b*d^3*n*r+2700*I*Pi*b*d^2*e*r^5*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-21375*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*(x^r)^2+1350*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*(x^r)^2-180000*a*d^3*r^3+362500*a*d^3*r^2-375000*a*d^3*r-937500*ln(
c)*b*d*e^2*r*(x^r)^2-363750*ln(c)*b*d^2*e*r^3*x^r+881250*ln(c)*b*d^2*e*r^2*
x^r-1031250*ln(c)*b*d^2*e*r*x^r-255000*ln(c)*b*d*e^2*r^3*(x^r)^2+712500*ln(
c)*b*d*e^2*r^2*(x^r)^2-187500*b*d^2*e*n*r*x^r+82500*b*d*e^2*n*r^2*(x^r)^2+1
38750*b*d^2*e*n*r^2*x^r+187500*I*Pi*b*d^3*r*csgn(I*c*x^n)^3+3300*I*Pi*b*d^3
*r^5*csgn(I*c*x^n)^3+90000*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3-90000*I*Pi*b*d^3*
r^3*csgn(I*c*x^n)^2*csgn(I*c)-468750*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^
n)^2*(x^r)^2-1350*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-180*
I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3-78125*I*Pi*b*d^3*csgn(I*c*x^n)^3+440625*I*Pi
*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+93750*b*d^2*e*n*x^r-255000*a*d
*e^2*r^3*(x^r)^2+712500*a*d*e^2*r^2*(x^r)^2-937500*a*d*e^2*r*(x^r)^2-363750
*a*d^2*e*r^3*x^r+881250*a*d^2*e*r^2*x^r+5000*I*Pi*b*e^3*r^4*csgn(I*x^n)*csg
n(I*c*x^n)^2*(x^r)^3-24125*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)-21375*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2-78125*I*Pi*b*e^3*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+234375*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*
c*x^n)^2*(x^r)^2+36000*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-234
375*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+78125*I*Pi*b*e^3*c
```

```
sgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+181250*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c
*x^n)^2-78125*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-5000*I*Pi*b*e^
3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+21375*I*Pi*b*d*e^2*r^4*cs
gn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-181875*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*c
sgn(I*c)*x^r+21375*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-23437
5*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+300*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*(x^r)^3-468750*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r
)^2+468750*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-51562
5*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-515625*I*Pi*b*d^2*e*r*csgn
(I*c*x^n)^2*csgn(I*c)*x^r-1350*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(
x^r)^2-5000*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3+24125*I*Pi*b*d^3*r^4*csg
n(I*x^n)*csgn(I*c*x^n)^2+24125*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)-140
625*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-140625*I*Pi*b*e^3*r*cs
gn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+234375*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^
n)^2*x^r+234375*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+96875*I*Pi*b*e^3
*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-3000*b*e^3*n*r^3*(x^r)^3-2700*a*d*
e^2*r^5*(x^r)^2+42750*a*d*e^2*r^4*(x^r)^2-5400*a*d^2*e*r^5*x^r+72000*a*d^2*
e*r^4*x^r+16250*b*e^3*n*r^2*(x^r)^3-37500*b*e^3*n*r*(x^r)^3+93750*b*d*e^2*n
*(x^r)^2+200*b*e^3*n*r^4*(x^r)^3-1031250*a*d^2*e*r*x^r+468750*ln(c)*b*d^2*e
*x^r+468750*ln(c)*b*d*e^2*(x^r)^2-600*ln(c)*b*e^3*r^5*(x^r)^3+10000*ln(c)*b
*e^3*r^4*(x^r)^3-63750*ln(c)*b*e^3*r^3*(x^r)^3+193750*ln(c)*b*e^3*r^2*(x^r)
^3-281250*ln(c)*b*e^3*r*(x^r)^3-36000*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+
234375*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-180*I*Pi*b*d^3*r^6*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-440625*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x
^r+140625*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3-3300*I*Pi*b*d^3*r^5*csgn(I*x
^n)*csgn(I*c*x^n)^2+181875*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r+90000*I*Pi*
b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+31875*I*Pi*b*e^3*r^3*csgn(I*c
*x^n)^3*(x^r)^3+300*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3-3300*I*Pi*b*d^3*
r^5*csgn(I*c*x^n)^2*csgn(I*c)-150000*b*d*e^2*n*r*(x^r)^2-2700*ln(c)*b*d*e^2
*r^5*(x^r)^2+42750*ln(c)*b*d*e^2*r^4*(x^r)^2-5400*ln(c)*b*d^2*e*r^5*x^r+720
00*ln(c)*b*d^2*e*r^4*x^r+1350*b*d*e^2*n*r^4*(x^r)^2-18000*b*d*e^2*n*r^3*(x^
r)^2+5400*b*d^2*e*n*r^4*x^r-45000*b*d^2*e*n*r^3*x^r-2700*I*Pi*b*d^2*e*r^5*c
sgn(I*x^n)*csgn(I*c*x^n)^2*x^r-2700*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I
*c)*x^r+1350*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2+2700*I*Pi*b*d^2*e*r^5
*csgn(I*c*x^n)^3*x^r-24125*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3-181250*I*Pi*b*d^3
*r^2*csgn(I*c*x^n)^3-78125*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+78125*I*Pi*b*
d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+78125*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+
181875*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-356250*I*Pi
*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+127500*I*Pi*b*d*e^
2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-440625*I*Pi*b*d^2*e*r^2*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+515625*I*Pi*b*d^2*e*r*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*x^r+31875*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*(x^r)^3-127500*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2
-127500*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-31875*I*Pi*b*e^3
*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-31875*I*Pi*b*e^3*r^3*csgn(I*c*x^n)
^2*csgn(I*c)*(x^r)^3+180*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-234375*I*
Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2+78125*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^
n)^2*(x^r)^3-96875*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3-90000*I*Pi*b*d^3*
r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-187500*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^
n)^2-36000*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+468750*
I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+127500*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n
)^3*(x^r)^2-300*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-300*I*Pi
*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+5000*I*Pi*b*e^3*r^4*csgn(I*c*x
^n)^2*csgn(I*c)*(x^r)^3-181250*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)+96875*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-356250*I*Pi*b
*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2+515625*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^
r+187500*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c))/(-5+3*r)^2/x^5/(
2*r-5)^2/(r-5)^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-6>0)', see `assume?` for more det
ails)Is r-6 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^r)^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^6,x)
```

```
[Out] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^6, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] Timed out
```

3.404 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^8}\,dx$

Optimal. Leaf size=183

$$-\frac{d^3(a+b\log(cx^n))}{7x^7}-\frac{3d^2ex^{r-7}(a+b\log(cx^n))}{7-r}-\frac{3de^2x^{2r-7}(a+b\log(cx^n))}{7-2r}-\frac{e^3x^{3r-7}(a+b\log(cx^n))}{7-3r}-\frac{bd^3n}{49x^7}-\frac{3...}{}$$

```
[Out] -1/49*b*d^3*n/x^7-3*b*d^2*e*n*x^(-7+r)/(7-r)^2-3*b*d*e^2*n*x^(-7+2*r)/(7-2*
r)^2-b*e^3*n*x^(-7+3*r)/(7-3*r)^2-1/7*d^3*(a+b*ln(c*x^n))/x^7-3*d^2*e*x^(-7
+r)*(a+b*ln(c*x^n))/(7-r)-3*d*e^2*x^(-7+2*r)*(a+b*ln(c*x^n))/(7-2*r)-e^3*x^
(-7+3*r)*(a+b*ln(c*x^n))/(7-3*r)
```

Rubi [A] time = 0.41, antiderivative size = 155, normalized size of antiderivative = 0.85, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{7}\left(\frac{21d^2ex^{r-7}}{7-r}+\frac{d^3}{x^7}+\frac{21de^2x^{2r-7}}{7-2r}+\frac{7e^3x^{3r-7}}{7-3r}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r-7}}{(7-r)^2}-\frac{bd^3n}{49x^7}-\frac{3bde^2nx^{2r-7}}{(7-2r)^2}-\frac{be^3nx^{3r-7}}{(7-3r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^3*n)/(49*x^7) - (3*b*d^2*e*n*x^(-7 + r))/(7 - r)^2 - (3*b*d*e^2*n*x^(
-7 + 2*r))/(7 - 2*r)^2 - (b*e^3*n*x^(-7 + 3*r))/(7 - 3*r)^2 - ((d^3/x^7 + (
21*d^2*e*x^(-7 + r))/(7 - r) + (21*d*e^2*x^(-7 + 2*r))/(7 - 2*r) + (7*e^3*x
^(-7 + 3*r))/(7 - 3*r))*(a + b*Log[c*x^n]))/7
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^3\left(a+b\log\left(cx^n\right)\right)}{x^8}\,dx = -\frac{1}{7}\left(\frac{d^3}{x^7}+\frac{21d^2ex^{-7+r}}{7-r}+\frac{21de^2x^{-7+2r}}{7-2r}+\frac{7e^3x^{-7+3r}}{7-3r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn$$

$$= -\frac{1}{7}\left(\frac{d^3}{x^7}+\frac{21d^2ex^{-7+r}}{7-r}+\frac{21de^2x^{-7+2r}}{7-2r}+\frac{7e^3x^{-7+3r}}{7-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{7}(b$$

$$= -\frac{1}{7}\left(\frac{d^3}{x^7}+\frac{21d^2ex^{-7+r}}{7-r}+\frac{21de^2x^{-7+2r}}{7-2r}+\frac{7e^3x^{-7+3r}}{7-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{7}(b$$

$$= -\frac{bd^3n}{49x^7}-\frac{3bd^2enx^{-7+r}}{(7-r)^2}-\frac{3bde^2nx^{-7+2r}}{(7-2r)^2}-\frac{be^3nx^{-7+3r}}{(7-3r)^2}-\frac{1}{7}\left(\frac{d^3}{x^7}+\frac{21d^2ex^{-7+}}{7-r}\right.$$

Mathematica [A] time = 0.41, size = 188, normalized size = 1.03

$$\frac{7a\left(-d^3+\frac{21d^2ex^r}{r-7}+\frac{21de^2x^{2r}}{2r-7}+\frac{7e^3x^{3r}}{3r-7}\right)+7b\log\left(cx^n\right)\left(-d^3+\frac{21d^2ex^r}{r-7}+\frac{21de^2x^{2r}}{2r-7}+\frac{7e^3x^{3r}}{3r-7}\right)+bn\left(-d^3-\frac{147d^2ex^r}{(r-7)^2}-\frac{147}{(7}\right.}{49x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] (b*n*(-d^3 - (147*d^2*e*x^r)/(-7 + r)^2 - (147*d*e^2*x^(2*r))/(7 - 2*r)^2 -
 (49*e^3*x^(3*r))/(7 - 3*r)^2) + 7*a*(-d^3 + (21*d^2*e*x^r)/(-7 + r) + (21*
d*e^2*x^(2*r))/(-7 + 2*r) + (7*e^3*x^(3*r))/(-7 + 3*r)) + 7*b*(-d^3 + (21*d
^2*e*x^r)/(-7 + r) + (21*d*e^2*x^(2*r))/(-7 + 2*r) + (7*e^3*x^(3*r))/(-7 +
3*r))*Log[c*x^n])/(49*x^7)
```

fricas [B] time = 0.44, size = 981, normalized size = 5.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")
```

```
[Out] -1/49*(36*(b*d^3*n + 7*a*d^3)*r^6 - 924*(b*d^3*n + 7*a*d^3)*r^5 + 117649*b*
d^3*n + 9457*(b*d^3*n + 7*a*d^3)*r^4 + 823543*a*d^3 - 49392*(b*d^3*n + 7*a*
d^3)*r^3 + 139258*(b*d^3*n + 7*a*d^3)*r^2 - 201684*(b*d^3*n + 7*a*d^3)*r -
49*(12*a*e^3*r^5 - 2401*b*e^3*n - 4*(b*e^3*n + 70*a*e^3)*r^4 - 16807*a*e^3
+ 21*(4*b*e^3*n + 119*a*e^3)*r^3 - 49*(13*b*e^3*n + 217*a*e^3)*r^2 + 1029*(
2*b*e^3*n + 21*a*e^3)*r + (12*b*e^3*r^5 - 280*b*e^3*r^4 + 2499*b*e^3*r^3 -
10633*b*e^3*r^2 + 21609*b*e^3*r - 16807*b*e^3)*log(c) + (12*b*e^3*n*r^5 - 2
80*b*e^3*n*r^4 + 2499*b*e^3*n*r^3 - 10633*b*e^3*n*r^2 + 21609*b*e^3*n*r - 1
6807*b*e^3*n)*log(x))*x^(3*r) - 147*(18*a*d*e^2*r^5 - 2401*b*d*e^2*n - 3*(3
*b*d*e^2*n + 133*a*d*e^2)*r^4 - 16807*a*d*e^2 + 28*(6*b*d*e^2*n + 119*a*d*e
^2)*r^3 - 98*(11*b*d*e^2*n + 133*a*d*e^2)*r^2 + 686*(4*b*d*e^2*n + 35*a*d*e
^2)*r + (18*b*d*e^2*r^5 - 399*b*d*e^2*r^4 + 3332*b*d*e^2*r^3 - 13034*b*d*e^
2*r^2 + 24010*b*d*e^2*r - 16807*b*d*e^2)*log(c) + (18*b*d*e^2*n*r^5 - 399*b
*d*e^2*n*r^4 + 3332*b*d*e^2*n*r^3 - 13034*b*d*e^2*n*r^2 + 24010*b*d*e^2*n*r
 - 16807*b*d*e^2*n)*log(x))*x^(2*r) - 147*(36*a*d^2*e*r^5 - 2401*b*d^2*e*n
- 12*(3*b*d^2*e*n + 56*a*d^2*e)*r^4 - 16807*a*d^2*e + 7*(60*b*d^2*e*n + 679
*a*d^2*e)*r^3 - 49*(37*b*d^2*e*n + 329*a*d^2*e)*r^2 + 343*(10*b*d^2*e*n + 7
7*a*d^2*e)*r + (36*b*d^2*e*r^5 - 672*b*d^2*e*r^4 + 4753*b*d^2*e*r^3 - 16121
*b*d^2*e*r^2 + 26411*b*d^2*e*r - 16807*b*d^2*e)*log(c) + (36*b*d^2*e*n*r^5
- 672*b*d^2*e*n*r^4 + 4753*b*d^2*e*n*r^3 - 16121*b*d^2*e*n*r^2 + 26411*b*d^
2*e*n*r - 16807*b*d^2*e*n)*log(x))*x^r + 7*(36*b*d^3*r^6 - 924*b*d^3*r^5 +
9457*b*d^3*r^4 - 49392*b*d^3*r^3 + 139258*b*d^3*r^2 - 201684*b*d^3*r + 1176
49*b*d^3)*log(c) + 7*(36*b*d^3*n*r^6 - 924*b*d^3*n*r^5 + 9457*b*d^3*n*r^4 -
```

```
49392*b*d^3*n*r^3 + 139258*b*d^3*n*r^2 - 201684*b*d^3*n*r + 117649*b*d^3*n
)*log(x))/((36*r^6 - 924*r^5 + 9457*r^4 - 49392*r^3 + 139258*r^2 - 201684*r
 + 117649)*x^7)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r + d)^3 (b \log (cx^n) + a)}{x^8} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^8,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^8, x)
```

maple [C] time = 0.51, size = 4031, normalized size = 22.03

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(b*ln(c*x^n)+a)/x^8,x)
```

```
[Out] -1/7*b*(-14*e^3*r^2*(x^r)^3-63*d*e^2*r^2*(x^r)^2+147*e^3*r*(x^r)^3+6*d^3*r^
3-126*d^2*e*r^2*x^r+588*d*e^2*r*(x^r)^2-343*e^3*(x^r)^3-77*d^3*r^2+735*d^2*
e*r*x^r-1029*d*e^2*(x^r)^2+294*d^3*r-1029*d^2*e*x^r-343*d^3)/x^7/(-7+3*r)/(
2*r-7)/(r-7)*ln(x^n)-1/98*(98784*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)
*x^r-521017*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-6986
91*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+1915998*I*Pi*b*d*e^2*r^2*
csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1915998*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^
2*csgn(I*c)*(x^r)^2+122451*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*(x^r)^3-12936*a*d^3*r^5+132398*a*d^3*r^4+72*b*d^3*n*r^6-1848*b*d^3*n*r^5
+18914*b*d^3*n*r^4+1647086*a*e^3*(x^r)^3+1647086*a*d^3+504*ln(c)*b*d^3*r^6-
12936*ln(c)*b*d^3*r^5+132398*ln(c)*b*d^3*r^4-691488*ln(c)*b*d^3*r^3+1949612
*ln(c)*b*d^3*r^2-2823576*ln(c)*b*d^3*r+504*a*d^3*r^6+235298*b*d^3*n-1176*a*
e^3*r^5*(x^r)^3+27440*a*e^3*r^4*(x^r)^3+1647086*ln(c)*b*e^3*(x^r)^3+235298*
b*e^3*n*(x^r)^3-244902*a*e^3*r^3*(x^r)^3+1042034*a*e^3*r^2*(x^r)^3-2117682*
a*e^3*r*(x^r)^3+4941258*a*d*e^2*(x^r)^2+4941258*a*d^2*e*x^r+1647086*b*d^3*l
n(c)-98784*b*d^3*n*r^3+278516*b*d^3*n*r^2-403368*b*d^3*n*r-691488*a*d^3*r^3
+1949612*a*d^3*r^2-2823576*a*d^3*r-5292*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I
*c*x^n)^2*x^r-5292*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r+58653*I*P
i*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+252*I*Pi*b*d^3*r^6*csgn(I
*x^n)*csgn(I*c*x^n)^2-345744*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)+97480
6*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)-7058940*ln(c)*b*d*e^2*r*(x^r)^2-
1397382*ln(c)*b*d^2*e*r^3*x^r+4739574*ln(c)*b*d^2*e*r^2*x^r-7764834*ln(c)*b
*d^2*e*r*x^r-979608*ln(c)*b*d*e^2*r^3*(x^r)^2+3831996*ln(c)*b*d*e^2*r^2*(x^
r)^2-1008420*b*d^2*e*n*r*x^r+316932*b*d*e^2*n*r^2*(x^r)^2+533022*b*d^2*e*n*
r^2*x^r-2369787*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+58
653*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+98784*I*Pi*b*d^2*e*r
^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1058841*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*
c*x^n)^2*(x^r)^3-1058841*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-236
9787*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r+3529470*I*Pi*b*d*e^2*r*csgn(I*c*x
^n)^3*(x^r)^2-489804*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-4
89804*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-2646*I*Pi*b*d*e^2*
r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-823543*I*Pi*b*d^3*csgn(I*c*x^n)^3+823
543*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+1058841*I*Pi*b*e^3*r*csg
n(I*c*x^n)^3*(x^r)^3-521017*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3+122451*I
*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+705894*b*d^2*e*n*x^r-979608*a*d*e^2*r
^3*(x^r)^2+3831996*a*d*e^2*r^2*(x^r)^2-7058940*a*d*e^2*r*(x^r)^2-1397382*a*
d^2*e*r^3*x^r+4739574*a*d^2*e*r^2*x^r+345744*I*Pi*b*d^3*r^3*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)+521017*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^
```

3+698691*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r-1915998*I*Pi*b*d*e^2*r^2*csgn
(I*c*x^n)^3*(x^r)^2-3529470*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r
)^2-2646*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-2470629*I*Pi*
b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-2470629*I*Pi*b*d^2*e*cs
gn(I*c*x^n)^3*x^r+588*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3-13720*I*Pi*b*e
^3*r^4*csgn(I*c*x^n)^3*(x^r)^3-6468*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c
)-345744*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1411788*I*Pi*b*d^3*r*cs
gn(I*x^n)*csgn(I*c*x^n)^2-1411788*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)-82
3543*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-698691*I*Pi*b*d^2*e*r^3
*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+1058841*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*(x^r)^3+2369787*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2
*x^r-13720*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+588*I
*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-3529470*I*Pi*b*d*
e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-3882417*I*Pi*b*d^2*e*r*csgn(I*x^n)*
csgn(I*c*x^n)^2*x^r-3882417*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r-24
70629*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2369787*I*Pi*b*d
^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-252*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)+6468*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-
252*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+6468*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3-6619
9*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3+345744*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3+6619
9*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+66199*I*Pi*b*d^3*r^4*csgn(I*c*
x^n)^2*csgn(I*c)+823543*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+974806
*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1411788*I*Pi*b*d^3*r*csgn(I*c*x
^n)^3-823543*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+823543*I*Pi*b*d^3*csgn(I*x^
n)*csgn(I*c*x^n)^2+823543*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-8232*b*e^3*n
r^3(x^r)^3-5292*a*d*e^2*r^5*(x^r)^2+117306*a*d*e^2*r^4*(x^r)^2-10584*a*d^
2*e*r^5*x^r+197568*a*d^2*e*r^4*x^r+62426*b*e^3*n*r^2*(x^r)^3-201684*b*e^3*n
r(x^r)^3+705894*b*d*e^2*n*(x^r)^2+5292*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*x^r+392*b*e^3*n*r^4*(x^r)^3-7764834*a*d^2*e*r*x^r+494125
8*ln(c)*b*d^2*e*x^r+4941258*ln(c)*b*d*e^2*(x^r)^2-1176*ln(c)*b*e^3*r^5*(x^r
)^3+27440*ln(c)*b*e^3*r^4*(x^r)^3-244902*ln(c)*b*e^3*r^3*(x^r)^3+1042034*ln
(c)*b*e^3*r^2*(x^r)^3-2117682*ln(c)*b*e^3*r*(x^r)^3-122451*I*Pi*b*e^3*r^3*c
sgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+13720*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(
I*c)*(x^r)^3-974806*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-5865
3*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-66199*I*Pi*b
*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-974806*I*Pi*b*d^3*r^2*csgn(I*c
*x^n)^3-58653*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2-823543*I*Pi*b*e^3*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+2470629*I*Pi*b*d*e^2*csgn(I*x^n)*
csgn(I*c*x^n)^2*(x^r)^2+489804*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-588
*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-588*I*Pi*b*e^3*r^5*csgn
(I*c*x^n)^2*csgn(I*c)*(x^r)^3-806736*b*d*e^2*n*r*(x^r)^2-5292*ln(c)*b*d*e^2
r^5(x^r)^2+117306*ln(c)*b*d*e^2*r^4*(x^r)^2-10584*ln(c)*b*d^2*e*r^5*x^r+1
97568*ln(c)*b*d^2*e*r^4*x^r+2646*b*d*e^2*n*r^4*(x^r)^2-49392*b*d*e^2*n*r^3*
(x^r)^2+10584*b*d^2*e*n*r^4*x^r-123480*b*d^2*e*n*r^3*x^r+252*I*Pi*b*d^3*r^6
*csgn(I*c*x^n)^2*csgn(I*c)-6468*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2-
2470629*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2+3529470*I*Pi*b*d*e^2*r*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-1915998*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*(x^r)^2+3882417*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*x^r-98784*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*x^r+2470629*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+2470629*I*Pi*b*
d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+521017*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(
I*c*x^n)^2*(x^r)^3-122451*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^
3+698691*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+489804*I*
Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+2646*I*Pi*b*d*e^
2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-98784*I*Pi*b*d^2*e*r^4*cs
gn(I*c*x^n)^3*x^r+3882417*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r+2470629*I*Pi*b
*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+1411788*I*Pi*b*d^3*r*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+2646*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2+13720*
I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+5292*I*Pi*b*d^2*e*r^5*cs

```
gn(I*c*x^n)^3*x^r)/(-7+3*r)^2/x^7/(2*r-7)^2/(r-7)^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-8>0)', see `assume?` for more det
ails)Is r-8 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(d+e\,x^r\right)}^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^8,x)
```

```
[Out] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^8, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] Timed out
```

3.405 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^{10}}\,dx$

Optimal. Leaf size=191

$$-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{9x^9}-\frac{3d^2ex^{r-9}\left(a+b\log\left(cx^n\right)\right)}{9-r}-\frac{3de^2x^{2r-9}\left(a+b\log\left(cx^n\right)\right)}{9-2r}-\frac{e^3x^{-3(3-r)}\left(a+b\log\left(cx^n\right)\right)}{3(3-r)}-\frac{bd^3}{81x}$$

```
[Out] -1/81*b*d^3*n/x^9-1/9*b*e^3*n/(3-r)^2/(x^(9-3*r))-3*b*d^2*e*n*x^(-9+r)/(9-r
)^2-3*b*d*e^2*n*x^(-9+2*r)/(9-2*r)^2-1/9*d^3*(a+b*ln(c*x^n))/x^9-1/3*e^3*(a
+b*ln(c*x^n))/(3-r)/(x^(9-3*r))-3*d^2*e*x^(-9+r)*(a+b*ln(c*x^n))/(9-r)-3*d*
e^2*x^(-9+2*r)*(a+b*ln(c*x^n))/(9-2*r)
```

Rubi [A] time = 0.42, antiderivative size = 161, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{9}\left(\frac{27d^2ex^{r-9}}{9-r}+\frac{d^3}{x^9}+\frac{27de^2x^{2r-9}}{9-2r}+\frac{3e^3x^{-3(3-r)}}{3-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r-9}}{(9-r)^2}-\frac{bd^3n}{81x^9}-\frac{3bde^2nx^{2r-9}}{(9-2r)^2}-\frac{be^3nx^{-3}}{9(3-}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] -(b*d^3*n)/(81*x^9) - (b*e^3*n)/(9*(3 - r)^2*x^(3*(3 - r))) - (3*b*d^2*e*n*
x^(-9 + r))/(9 - r)^2 - (3*b*d*e^2*n*x^(-9 + 2*r))/(9 - 2*r)^2 - ((d^3/x^9
+ (3*e^3)/((3 - r)*x^(3*(3 - r))) + (27*d^2*e*x^(-9 + r))/(9 - r) + (27*d*e
^2*x^(-9 + 2*r))/(9 - 2*r))*(a + b*Log[c*x^n]))/9
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^3\left(a+b\log\left(cx^n\right)\right)}{x^{10}}\,dx = -\frac{1}{9}\left(\frac{d^3}{x^9}+\frac{3e^3x^{-3(3-r)}}{3-r}+\frac{27d^2ex^{-9+r}}{9-r}+\frac{27de^2x^{-9+2r}}{9-2r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)$$

$$= -\frac{1}{9}\left(\frac{d^3}{x^9}+\frac{3e^3x^{-3(3-r)}}{3-r}+\frac{27d^2ex^{-9+r}}{9-r}+\frac{27de^2x^{-9+2r}}{9-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}(bn$$

$$= -\frac{1}{9}\left(\frac{d^3}{x^9}+\frac{3e^3x^{-3(3-r)}}{3-r}+\frac{27d^2ex^{-9+r}}{9-r}+\frac{27de^2x^{-9+2r}}{9-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}(bn$$

$$= -\frac{bd^3n}{81x^9}-\frac{be^3nx^{-3(3-r)}}{9(3-r)^2}-\frac{3bd^2enx^{-9+r}}{(9-r)^2}-\frac{3bde^2nx^{-9+2r}}{(9-2r)^2}-\frac{1}{9}\left(\frac{d^3}{x^9}+\frac{3e^3x^{-3(3-r)}}{3-r}\right.$$

Mathematica [A] time = 0.41, size = 182, normalized size = 0.95

$$\frac{9a\left(-d^3+\frac{27d^2ex^r}{r-9}+\frac{27de^2x^{2r}}{2r-9}+\frac{3e^3x^{3r}}{r-3}\right)+9b\log\left(cx^n\right)\left(-d^3+\frac{27d^2ex^r}{r-9}+\frac{27de^2x^{2r}}{2r-9}+\frac{3e^3x^{3r}}{r-3}\right)+bn\left(-d^3-\frac{243d^2ex^r}{(r-9)^2}-\frac{243de^2x}{(9-2r)}\right.}{81x^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] (b*n*(-d^3 - (243*d^2*e*x^r)/(-9 + r)^2 - (243*d*e^2*x^(2*r))/(9 - 2*r)^2 -
 (9*e^3*x^(3*r))/(-3 + r)^2) + 9*a*(-d^3 + (27*d^2*e*x^r)/(-9 + r) + (27*d*
e^2*x^(2*r))/(-9 + 2*r) + (3*e^3*x^(3*r))/(-3 + r)) + 9*b*(-d^3 + (27*d^2*e
*x^r)/(-9 + r) + (27*d*e^2*x^(2*r))/(-9 + 2*r) + (3*e^3*x^(3*r))/(-3 + r))*
Log[c*x^n])/(81*x^9)
```

fricas [B] time = 0.44, size = 981, normalized size = 5.14

$$-\frac{4\left(bd^3n+9\,ad^3\right)r^6-132\left(bd^3n+9\,ad^3\right)r^5+59049\,bd^3n+1737\left(bd^3n+9\,ad^3\right)r^4+531441\,ad^3-11664\left(bd^3n+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^10,x, algorithm="fricas")
```

```
[Out] -1/81*(4*(b*d^3*n + 9*a*d^3)*r^6 - 132*(b*d^3*n + 9*a*d^3)*r^5 + 59049*b*d^
3*n + 1737*(b*d^3*n + 9*a*d^3)*r^4 + 531441*a*d^3 - 11664*(b*d^3*n + 9*a*d^
3)*r^3 + 42282*(b*d^3*n + 9*a*d^3)*r^2 - 78732*(b*d^3*n + 9*a*d^3)*r - 9*(1
2*a*e^3*r^5 - 6561*b*e^3*n - 4*(b*e^3*n + 90*a*e^3)*r^4 - 59049*a*e^3 + 27*
(4*b*e^3*n + 153*a*e^3)*r^3 - 81*(13*b*e^3*n + 279*a*e^3)*r^2 + 2187*(2*b*e
^3*n + 27*a*e^3)*r + 3*(4*b*e^3*r^5 - 120*b*e^3*r^4 + 1377*b*e^3*r^3 - 7533
*b*e^3*r^2 + 19683*b*e^3*r - 19683*b*e^3)*log(c) + 3*(4*b*e^3*n*r^5 - 120*b
*e^3*n*r^4 + 1377*b*e^3*n*r^3 - 7533*b*e^3*n*r^2 + 19683*b*e^3*n*r - 19683*
b*e^3*n)*log(x))*x^(3*r) - 243*(2*a*d*e^2*r^5 - 729*b*d*e^2*n - (b*d*e^2*n
+ 57*a*d*e^2)*r^4 - 6561*a*d*e^2 + 12*(2*b*d*e^2*n + 51*a*d*e^2)*r^3 - 18*(
11*b*d*e^2*n + 171*a*d*e^2)*r^2 + 162*(4*b*d*e^2*n + 45*a*d*e^2)*r + (2*b*d
*e^2*r^5 - 57*b*d*e^2*r^4 + 612*b*d*e^2*r^3 - 3078*b*d*e^2*r^2 + 7290*b*d*e
^2*r - 6561*b*d*e^2)*log(c) + (2*b*d*e^2*n*r^5 - 57*b*d*e^2*n*r^4 + 612*b*d
*e^2*n*r^3 - 3078*b*d*e^2*n*r^2 + 7290*b*d*e^2*n*r - 6561*b*d*e^2*n)*log(x)
)*x^(2*r) - 243*(4*a*d^2*e*r^5 - 729*b*d^2*e*n - 4*(b*d^2*e*n + 24*a*d^2*e)
*r^4 - 6561*a*d^2*e + 3*(20*b*d^2*e*n + 291*a*d^2*e)*r^3 - 9*(37*b*d^2*e*n
+ 423*a*d^2*e)*r^2 + 81*(10*b*d^2*e*n + 99*a*d^2*e)*r + (4*b*d^2*e*r^5 - 96
*b*d^2*e*r^4 + 873*b*d^2*e*r^3 - 3807*b*d^2*e*r^2 + 8019*b*d^2*e*r - 6561*b
*d^2*e)*log(c) + (4*b*d^2*e*n*r^5 - 96*b*d^2*e*n*r^4 + 873*b*d^2*e*n*r^3 -
3807*b*d^2*e*n*r^2 + 8019*b*d^2*e*n*r - 6561*b*d^2*e*n)*log(x))*x^r + 9*(4*
b*d^3*r^6 - 132*b*d^3*r^5 + 1737*b*d^3*r^4 - 11664*b*d^3*r^3 + 42282*b*d^3*
```

```
r^2 - 78732*b*d^3*r + 59049*b*d^3)*log(c) + 9*(4*b*d^3*n*r^6 - 132*b*d^3*n*
r^5 + 1737*b*d^3*n*r^4 - 11664*b*d^3*n*r^3 + 42282*b*d^3*n*r^2 - 78732*b*d^
3*n*r + 59049*b*d^3*n)*log(x))/((4*r^6 - 132*r^5 + 1737*r^4 - 11664*r^3 + 4
2282*r^2 - 78732*r + 59049)*x^9)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r + d)^3 (b \log(cx^n) + a)}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^10,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^10, x)
```

maple [C] time = 0.52, size = 4027, normalized size = 21.08

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(b*ln(c*x^n)+a)/x^10,x)
```

```
[Out] -1/9*b*(-6*e^3*r^2*(x^r)^3-27*d*e^2*r^2*(x^r)^2+81*e^3*r*(x^r)^3+2*d^3*r^3-
54*d^2*e*r^2*x^r+324*d*e^2*r*(x^r)^2-243*e^3*(x^r)^3-33*d^3*r^2+405*d^2*e*r
*x^r-729*d*e^2*(x^r)^2+162*d^3*r-729*d^2*e*x^r-243*d^3)/x^9/(r-3)/(-9+2*r)/
(-9+r)*ln(x^n)-1/162*(-2376*a*d^3*r^5+31266*a*d^3*r^4+8*b*d^3*n*r^6-264*b*d
^3*n*r^5+3474*b*d^3*n*r^4+1062882*a*e^3*(x^r)^3+1062882*a*d^3+72*ln(c)*b*d^
3*r^6-2376*ln(c)*b*d^3*r^5+31266*ln(c)*b*d^3*r^4-209952*ln(c)*b*d^3*r^3+761
076*ln(c)*b*d^3*r^2-1417176*ln(c)*b*d^3*r+72*a*d^3*r^6+118098*b*d^3*n-216*a
*e^3*r^5*(x^r)^3+6480*a*e^3*r^4*(x^r)^3+1062882*ln(c)*b*e^3*(x^r)^3+118098*
b*e^3*n*(x^r)^3-74358*a*e^3*r^3*(x^r)^3+406782*a*e^3*r^2*(x^r)^3-1062882*a*
e^3*r*(x^r)^3+3188646*a*d*e^2*(x^r)^2+3188646*a*d^2*e*x^r+1062882*b*d^3*ln(
c)-23328*b*d^3*n*r^3+84564*b*d^3*n*r^2-157464*b*d^3*n*r-209952*a*d^3*r^3+76
1076*a*d^3*r^2-1417176*a*d^3*r+23328*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*
x^n)^2*x^r-486*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+747954*I*
Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1771470*I*Pi*b*d*e^2*r*c
sgn(I*c*x^n)^3*(x^r)^2+148716*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-108*
I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-1771470*I*Pi*b*d*e^2*r*c
sgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-486*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*
c*x^n)^2*(x^r)^2-1594323*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(
x^r)^2+23328*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r-3542940*ln(c)*b
*d*e^2*r*(x^r)^2-424278*ln(c)*b*d^2*e*r^3*x^r+1850202*ln(c)*b*d^2*e*r^2*x^r
-3897234*ln(c)*b*d^2*e*r*x^r-297432*ln(c)*b*d*e^2*r^3*(x^r)^2+1495908*ln(c)
*b*d*e^2*r^2*(x^r)^2-393660*b*d^2*e*n*r*x^r+96228*b*d*e^2*n*r^2*(x^r)^2+161
838*b*d^2*e*n*r^2*x^r+747954*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^
r)^2+37179*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-14871
6*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-148716*I*Pi*b*d*e^2*
r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-36*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+212
139*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r-747954*I*Pi*b*d*e^2*r^2*csgn(I*c*x
^n)^3*(x^r)^2-531441*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-53144
1*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-925101*I*Pi*b*d^2*e*r^2*cs
gn(I*c*x^n)^3*x^r-37179*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-
37179*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+3240*I*Pi*b*e^3*r^4*
csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-380538*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)+36*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-1948617*I*Pi*b
*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1948617*I*Pi*b*d^2*e*r*csgn(I*c*x^
n)^2*csgn(I*c)*x^r+108*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(
x^r)^3+925101*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+531441*I*Pi*b*
d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+531441*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)
```

+1188*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3-15633*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3-2
03391*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3+37179*I*Pi*b*e^3*r^3*csgn(I*c*
x^n)^3*(x^r)^3-1594323*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+108*I*Pi*b*e^3*r^5*
csgn(I*c*x^n)^3*(x^r)^3+354294*b*d^2*e*n*x^r-297432*a*d*e^2*r^3*(x^r)^2+149
5908*a*d*e^2*r^2*(x^r)^2-3542940*a*d*e^2*r*(x^r)^2-424278*a*d^2*e*r^3*x^r+1
850202*a*d^2*e*r^2*x^r-3240*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3-1188*I*P
i*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)+15633*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn
(I*c*x^n)^2-380538*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3+708588*I*Pi*b*d^3*r*csgn(
I*c*x^n)^3-531441*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3-203391*I*Pi*b*e^3*r^2*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-212139*I*Pi*b*d^2*e*r^3*csgn(I*
c*x^n)^2*csgn(I*c)*x^r+972*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r-23328*I*Pi*
b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+1948617*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r+
1594323*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+708588*I*Pi*b*d^3*r*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-104976*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(
I*c*x^n)^2-708588*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2-708588*I*Pi*b*d^
3*r*csgn(I*c*x^n)^2*csgn(I*c)-531441*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)-531441*I*Pi*b*d^3*csgn(I*c*x^n)^3-1944*b*e^3*n*r^3*(x^r)^3-972*a*d
*e^2*r^5*(x^r)^2+27702*a*d*e^2*r^4*(x^r)^2-1944*a*d^2*e*r^5*x^r+46656*a*d^2
*e*r^4*x^r+18954*b*e^3*n*r^2*(x^r)^3-78732*b*e^3*n*r*(x^r)^3+354294*b*d*e^2
n(x^r)^2+72*b*e^3*n*r^4*(x^r)^3-3897234*a*d^2*e*r*x^r+3188646*ln(c)*b*d^2
*e*x^r+3188646*ln(c)*b*d*e^2*(x^r)^2-216*ln(c)*b*e^3*r^5*(x^r)^3+6480*ln(c)
*b*e^3*r^4*(x^r)^3-74358*ln(c)*b*e^3*r^3*(x^r)^3+406782*ln(c)*b*e^3*r^2*(x^
r)^3-1062882*ln(c)*b*e^3*r*(x^r)^3-925101*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)*x^r+1771470*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*(x^r)^2+1948617*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
x^r+1188*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-15633*I*Pi*b*d^
3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-13851*I*Pi*b*d*e^2*r^4*csgn(I*c*x
^n)^3*(x^r)^2-531441*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3
-314928*b*d*e^2*n*r*(x^r)^2-972*ln(c)*b*d*e^2*r^5*(x^r)^2+27702*ln(c)*b*d*e
^2*r^4*(x^r)^2-1944*ln(c)*b*d^2*e*r^5*x^r+46656*ln(c)*b*d^2*e*r^4*x^r+486*b
*d*e^2*n*r^4*(x^r)^2-11664*b*d*e^2*n*r^3*(x^r)^2+1944*b*d^2*e*n*r^4*x^r-291
60*b*d^2*e*n*r^3*x^r+531441*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+
531441*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3-212139*I*Pi*b*d^2*e*r^3*csgn(I*
x^n)*csgn(I*c*x^n)^2*x^r+531441*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*(x^r)^3+925101*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-3240*
I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+104976*I*Pi*b*d^
3*r^3*csgn(I*c*x^n)^3+486*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
c)(x^r)^2+972*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-13
851*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-747954*I*P
i*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-36*I*Pi*b*d^3*r^6
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-108*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csg
n(I*c)*(x^r)^3+486*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2+3240*I*Pi*b*e^3
*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+104976*I*Pi*b*d^3*r^3*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)+203391*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^
r)^3+36*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2-23328*I*Pi*b*d^2*e*r^4*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+212139*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)*x^r+148716*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)*(x^r)^2-104976*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)+380538
*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)-1188*I*Pi*b*d^3*r^5*csgn(I*x^n)*c
sgn(I*c*x^n)^2-1594323*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-972*I*Pi*b*d^2*
e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-972*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*
csgn(I*c)*x^r+13851*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+13
851*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-1771470*I*Pi*b*d*e^2
*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+15633*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*c
sgn(I*c)+531441*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+380538*I*Pi*b*
d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1594323*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I
*c*x^n)^2*(x^r)^2+1594323*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+1594
323*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+203391*I*Pi*b*e^3*r^2*csgn(I
*x^n)*csgn(I*c*x^n)^2*(x^r)^3-1594323*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n

```
)*csgn(I*c)*x^r)/(r-3)^2/x^9/(-9+2*r)^2/(-9+r)^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^10,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(r-10>0)', see `assume?` for more de
tails)Is r-10 equal to -1?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^r)^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^10,x)
```

```
[Out] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x^10, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**10,x)
```

```
[Out] Timed out
```

3.406 $\int \frac{x^3(a+b\log(cx^n))}{d+ex^r}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{d+ex^r},x\right)$$

```
[Out] Unintegrable(x^3*(a+b*ln(c*x^n))/(d+e*x^r),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^r),x]
```

```
[Out] Defer[Int][(x^3*(a + b*Log[c*x^n]))/(d + e*x^r), x]
```

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx=\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Mathematica [A] time = 0.12, size = 87, normalized size = 3.35

$$\frac{x^4\left(4\,{}_2F_1\left(1,\frac{4}{r};\frac{r+4}{r};-\frac{ex^r}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\,{}_3F_2\left(1,\frac{4}{r},\frac{4}{r};1+\frac{4}{r},1+\frac{4}{r};-\frac{ex^r}{d}\right)\right)}{16d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^r),x]
```

```
[Out] (x^4*(-(b*n*HypergeometricPFQ[{1, 4/r, 4/r}, {1 + 4/r, 1 + 4/r}, -((e*x^r)/
d)]) + 4*Hypergeometric2F1[1, 4/r, (4 + r)/r, -((e*x^r)/d)]*(a + b*Log[c*x^
n])))/(16*d)
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{ex^r+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x^n) + a*x^3)/(e*x^r + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^3}{ex^r+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^r + d), x)
```

maple [A] time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^{n})+a)\,x^{3}}{e\,x^{r}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(d+e*x^r),x)
[Out] int(x^3*(b*ln(c*x^n)+a)/(d+e*x^r),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)x^{3}}{ex^{r}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^r + d), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^{3}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{d+e\,x^{r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x^r),x)
[Out] int((x^3*(a + b*log(c*x^n)))/(d + e*x^r), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3}\left(a+b\log\left(cx^{n}\right)\right)}{d+ex^{r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(d+e*x**r),x)
[Out] Integral(x**3*(a + b*log(c*x**n))/(d + e*x**r), x)
```

3.407 $\int \frac{x(a+b\log(cx^n))}{d+ex^r}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^r},x\right)$$

[Out] Unintegrable(x*(a+b*ln(c*x^n))/(d+e*x^r),x)

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^r),x]

[Out] Defer[Int][(x*(a + b*Log[c*x^n]))/(d + e*x^r), x]

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx=\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Mathematica [A] time = 0.11, size = 87, normalized size = 3.62

$$\frac{x^2\left(2\,{}_2F_1\left(1,\frac{2}{r};\frac{r+2}{r};-\frac{ex^r}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\,{}_3F_2\left(1,\frac{2}{r},\frac{2}{r};1+\frac{2}{r},1+\frac{2}{r};-\frac{ex^r}{d}\right)\right)}{4d}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^r),x]

[Out] (x^2*(-(b*n*HypergeometricPFQ[{1, 2/r, 2/r}, {1 + 2/r, 1 + 2/r}, -((e*x^r)/d)]) + 2*Hypergeometric2F1[1, 2/r, (2 + r)/r, -((e*x^r)/d)]*(a + b*Log[c*x^n])))/(4*d)

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx\log\left(cx^n\right)+ax}{ex^r+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="fricas")

[Out] integral((b*x*log(c*x^n) + a*x)/(e*x^r + d), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x}{ex^r+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="giac")

```
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^r + d), x)
```

maple [A] time = 0.69, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^{n})+a)\,x}{e\,x^{r}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x^r+d),x)
[Out] int(x*(b*ln(c*x^n)+a)/(e*x^r+d),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)x}{ex^{r}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^r + d), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{d+e\,x^{r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x^r),x)
[Out] int((x*(a + b*log(c*x^n)))/(d + e*x^r), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(a+b\log\left(cx^{n}\right)\right)}{d+ex^{r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(d+e*x**r),x)
[Out] Integral(x*(a + b*log(c*x**n))/(d + e*x**r), x)
```

3.408 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx$

Optimal. Leaf size=54

$$\frac{bn\mathrm{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{dr^2}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{dr}$$

```
[Out] -(a+b*ln(c*x^n))*ln(1+d/e/(x^r))/d/r+b*n*polylog(2,-d/e/(x^r))/d/r^2
```

Rubi [A] time = 0.08, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2345, 2391}

$$\frac{bn\mathrm{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{dr^2}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{dr}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)),x]
```

```
[Out] -(((a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d*r)) + (b*n*PolyLog[2, -(d/(e*x
^r))])/(d*r^2)
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log\left(cx^n\right)}{x\left(d+ex^r\right)}\,dx &= -\frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{dx^{-r}}{e}\right)}{dr}+\frac{(bn)\int\frac{\log\left(1+\frac{dx^{-r}}{e}\right)}{x}\,dx}{dr}\\ &= -\frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{dx^{-r}}{e}\right)}{dr}+\frac{bn\mathrm{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{dr^2}\end{aligned}$$

Mathematica [A] time = 0.12, size = 108, normalized size = 2.00

$$\frac{-2r\log\left(d-dx^r\right)\left(a+b\log\left(cx^n\right)\right)+2bn\mathrm{Li}_2\left(\frac{ex^r}{d}+1\right)+2bnr\log(x)\left(\log\left(d-dx^r\right)-\log\left(d+ex^r\right)\right)+2bn\log\left(-\frac{ex^r}{d}\right)\ldots}{2dr^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)),x]
```

```
[Out] (b*n*r^2*Log[x]^2 - 2*r*(a + b*Log[c*x^n])*Log[d - d*x^r] + 2*b*n*r*Log[x]*
(Log[d - d*x^r] - Log[d + e*x^r]) + 2*b*n*Log[-((e*x^r)/d)]*Log[d + e*x^r]
+ 2*b*n*PolyLog[2, 1 + (e*x^r)/d])/(2*d*r^2)
```

fricas [A] time = 0.41, size = 93, normalized size = 1.72

$$\frac{bnr^2\log(x)^2 - 2\,bnr\log(x)\log\left(\frac{ex^r+d}{d}\right) - 2\,bn\mathrm{Li}_2\left(-\frac{ex^r+d}{d}+1\right) - 2\left(br\log(c)+ar\right)\log\left(ex^r+d\right) + 2\left(br^2\log(c)\right.}{2\,dr^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] 1/2*(b*n*r^2*log(x)^2 - 2*b*n*r*log(x)*log((e*x^r + d)/d) - 2*b*n*dilog(-(e
*x^r + d)/d + 1) - 2*(b*r*log(c) + a*r)*log(e*x^r + d) + 2*(b*r^2*log(c) +
a*r^2)*log(x))/(d*r^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^r+d\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x), x)
```

maple [C] time = 0.25, size = 451, normalized size = 8.35

$$\frac{bn\ln(x)^2}{2d} - \frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln\left(x^r\right)}{2dr} + \frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln\left(e\,x^r+d\right)}{2dr} + \frac{i\pi b\,\mathrm{c}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^r+d),x)
```

```
[Out] -b/r/d*ln(x^r)*n*ln(x)+b/r/d*ln(x^r)*ln(x^n)+b/r/d*ln(e*x^r+d)*n*ln(x)-b/r/
d*ln(e*x^r+d)*ln(x^n)+1/2*b/d*n*ln(x)^2-b/r*n/d*ln(x)*ln(1+e*x^r/d)-b/r^2*n
/d*polylog(2,-e*x^r/d)+1/2*I/r*b*Pi*csgn(I*c*x^n)^3/d*ln(e*x^r+d)-1/2*I/r*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*ln(x^r)-1/2*I/r*b*Pi*csgn(I*c*x^n
)^3/d*ln(x^r)+1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*ln(x^r)+1/2*I/r*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*ln(e*x^r+d)+1/2*I/r*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)^2/d*ln(x^r)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*ln(e*
x^r+d)-1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*ln(e*x^r+d)+1/r*b*ln(c)/d*l
n(x^r)-1/r*b*ln(c)/d*ln(e*x^r+d)+1/r*a/d*ln(x^r)-1/r*a/d*ln(e*x^r+d)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{\log(x)}{d} - \frac{\log\left(\frac{ex^r+d}{e}\right)}{dr}\right) + b\int \frac{\log(c)+\log\left(x^n\right)}{exx^r+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] a*(log(x)/d - log((e*x^r + d)/e)/(d*r)) + b*integrate((log(c) + log(x^n))/(
e*x*x^r + d*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x\,\left(d+e\,x^r\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^r)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^r)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r),x)
```

```
[Out] Timed out
```

3.409 $\int \frac{a+b\log(cx^n)}{x^3(d+ex^r)}\,dx$

Optimal. Leaf size=26

$$\mathrm{Int}\left(\frac{a+b\log(cx^n)}{x^3(d+ex^r)},x\right)$$

```
[Out] Unintegrable((a+b*ln(c*x^n))/x^3/(d+e*x^r),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex^r)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^r)),x]
[Out] Defer[Int][(a + b*Log[c*x^n])/(x^3*(d + e*x^r)), x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex^r)}\,dx = \int \frac{a+b\log(cx^n)}{x^3(d+ex^r)}\,dx$$

Mathematica [A] time = 0.12, size = 86, normalized size = 3.31

$$-\frac{bn\,{}_3F_2\left(1,-\frac{2}{r},-\frac{2}{r};1-\frac{2}{r},1-\frac{2}{r};-\frac{ex^r}{d}\right)+2\,{}_2F_1\left(1,-\frac{2}{r};\frac{r-2}{r};-\frac{ex^r}{d}\right)\left(a+b\log(cx^n)\right)}{4dx^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^r)),x]
[Out] -1/4*(b*n*HypergeometricPFQ[{1, -2/r, -2/r}, {1 - 2/r, 1 - 2/r}, -((e*x^r)/
d)] + 2*Hypergeometric2F1[1, -2/r, (-2 + r)/r, -((e*x^r)/d)]*(a + b*Log[c*x
^n]))/(d*x^2)
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\log(cx^n)+a}{ex^3x^r+dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r),x, algorithm="fricas")
[Out] integral((b*log(c*x^n) + a)/(e*x^3*x^r + d*x^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{(ex^r+d)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x^3), x)
```

maple [A] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^{n}\right)+a}{\left(e\,x^{r}+d\right)x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(e*x^r+d),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^3/(e*x^r+d),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right)+a}{(ex^{r}+d)x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{a+b\,\ln\left(c\,x^{n}\right)}{x^{3}\,\left(d+e\,x^{r}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x^r)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x^r)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\log\left(cx^{n}\right)}{x^{3}\left(d+ex^{r}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(d+e*x**r),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**3*(d + e*x**r)), x)
```

3.410 $\int \frac{x^2(a+b\log(cx^n))}{d+ex^r}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d+ex^r},x\right)$$

```
[Out] Unintegrable(x^2*(a+b*ln(c*x^n))/(d+e*x^r),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^r),x]
[Out] Defer[Int][(x^2*(a + b*Log[c*x^n]))/(d + e*x^r), x]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx=\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Mathematica [A] time = 0.11, size = 87, normalized size = 3.35

$$\frac{x^3\left(3\,{}_2F_1\left(1,\frac{3}{r};\frac{r+3}{r};-\frac{ex^r}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\,{}_3F_2\left(1,\frac{3}{r},\frac{3}{r};1+\frac{3}{r},1+\frac{3}{r};-\frac{ex^r}{d}\right)\right)}{9d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^r),x]
[Out] (x^3*(-(b*n*HypergeometricPFQ[{1, 3/r, 3/r}, {1 + 3/r, 1 + 3/r}, -((e*x^r)/
d)]) + 3*Hypergeometric2F1[1, 3/r, (3 + r)/r, -((e*x^r)/d)]*(a + b*Log[c*x^
n])))/(9*d)
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\log\left(cx^n\right)+ax^2}{ex^r+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="fricas")
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(e*x^r + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^2}{ex^r+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^r + d), x)
```

maple [A] time = 0.72, size = 0, normalized size = 0.00

$$\int \frac{(b \ln (c\, x^{n}) + a)\, x^{2}}{e\, x^{r} + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(e*x^r+d),x)
[Out] int(x^2*(b*ln(c*x^n)+a)/(e*x^r+d),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log \left(cx^{n}\right) + a\right)x^{2}}{ex^{r} + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^r + d), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^{2}\, \left(a + b\, \ln \left(c\, x^{n}\right)\right)}{d + e\, x^{r}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e*x^r),x)
[Out] int((x^2*(a + b*log(c*x^n)))/(d + e*x^r), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2} \left(a + b \log \left(cx^{n}\right)\right)}{d + ex^{r}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(d+e*x**r),x)
[Out] Integral(x**2*(a + b*log(c*x**n))/(d + e*x**r), x)
```

3.411 $\int \frac{a+b\log(cx^n)}{d+ex^r}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{a+b\log(cx^n)}{d+ex^r},x\right)$$

```
[Out] Unintegrable((a+b*ln(c*x^n))/(d+e*x^r),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\log(cx^n)}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^r),x]
```

```
[Out] Defer[Int][(a + b*Log[c*x^n])/(d + e*x^r), x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{d+ex^r}\,dx=\int \frac{a+b\log(cx^n)}{d+ex^r}\,dx$$

Mathematica [A] time = 0.09, size = 69, normalized size = 3.00

$$\frac{x\left({}_2F_1\left(1,\frac{1}{r};1+\frac{1}{r};-\frac{ex^r}{d}\right)\left(a+b\log(cx^n)\right)-bn\,{}_3F_2\left(1,\frac{1}{r},\frac{1}{r};1+\frac{1}{r},1+\frac{1}{r};-\frac{ex^r}{d}\right)\right)}{d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^r),x]
```

```
[Out] (x*(-(b*n*HypergeometricPFQ[{1, r^(-1), r^(-1)}, {1 + r^(-1), 1 + r^(-1)},
-((e*x^r)/d)]) + Hypergeometric2F1[1, r^(-1), 1 + r^(-1), -((e*x^r)/d)]*(a
+ b*Log[c*x^n])))/d
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{ex^r+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^r + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{ex^r+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^r + d), x)
```

maple [A] time = 0.64, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^{n}\right)+a}{e\,x^{r}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x^r+d),x)
```

```
[Out] int((b*ln(c*x^n)+a)/(e*x^r+d),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right)+a}{ex^{r}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^r + d), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{a+b\,\ln\left(c\,x^{n}\right)}{d+e\,x^{r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x^r),x)
```

```
[Out] int((a + b*log(c*x^n))/(d + e*x^r), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\log\left(cx^{n}\right)}{d+ex^{r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e*x**r),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(d + e*x**r), x)
```

3.412 $\int \frac{a+b\log(cx^n)}{x^2(d+ex^r)}\,dx$

Optimal. Leaf size=26

$$\operatorname{Int}\left(\frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)},x\right)$$

```
[Out] Unintegrable((a+b*ln(c*x^n))/x^2/(d+e*x^r),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^r)),x]
[Out] Defer[Int][(a + b*Log[c*x^n])/(x^2*(d + e*x^r)), x]
```

Rubi steps

$$\int \frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)}\,dx=\int \frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)}\,dx$$

Mathematica [A] time = 0.10, size = 83, normalized size = 3.19

$$-\frac{bn\,{}_3F_2\left(1,-\frac{1}{r},-\frac{1}{r};1-\frac{1}{r},1-\frac{1}{r};-\frac{ex^r}{d}\right)+{}_2F_1\left(1,-\frac{1}{r};\frac{r-1}{r};-\frac{ex^r}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{dx}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^r)),x]
[Out] -((b*n*HypergeometricPFQ[{1, -r^(-1), -r^(-1)}, {1 - r^(-1), 1 - r^(-1)}, -
((e*x^r)/d)] + Hypergeometric2F1[1, -r^(-1), (-1 + r)/r, -((e*x^r)/d)]*(a +
 b*Log[c*x^n]))/(d*x))
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{b\log\left(cx^n\right)+a}{ex^2x^r+dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r),x, algorithm="fricas")
[Out] integral((b*log(c*x^n) + a)/(e*x^2*x^r + d*x^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^r+d\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x^2), x)
```

maple [A] time = 0.72, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^{n}\right)+a}{\left(e\,x^{r}+d\right)x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(e*x^r+d),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x^2/(e*x^r+d),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right)+a}{(ex^{r}+d)x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{a+b\,\ln\left(c\,x^{n}\right)}{x^{2}\,\left(d+e\,x^{r}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x^r)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x^r)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\log\left(cx^{n}\right)}{x^{2}\left(d+ex^{r}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(d+e*x**r),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**2*(d + e*x**r)), x)
```

3.413 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex^r)^2}\,dx$

Optimal. Leaf size=26

$$\operatorname{Int}\left(\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2},x\right)$$

```
[Out] Unintegrable(x^3*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
[Out] Defer[Int][(x^3*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx=\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Mathematica [A] time = 0.26, size = 140, normalized size = 5.38

$$\frac{x^4\left(-bn(r-4)\left(d+ex^r\right)\,{}_3F_2\left(1,\frac{4}{r},\frac{4}{r};1+\frac{4}{r},1+\frac{4}{r};-\frac{ex^r}{d}\right)+4\left(d+ex^r\right)\,{}_2F_1\left(1,\frac{4}{r};\frac{r+4}{r};-\frac{ex^r}{d}\right)\left(a(r-4)+b(r-4)\log\ldots\right.\right.}{16d^2r\left(d+ex^r\right)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
[Out] (x^4*(-(b*n*(-4 + r)*(d + e*x^r)*HypergeometricPFQ[{1, 4/r, 4/r}, {1 + 4/r,
 1 + 4/r}, -((e*x^r)/d)]) + 16*d*(a + b*Log[c*x^n]) + 4*(d + e*x^r)*Hyperge
ometric2F1[1, 4/r, (4 + r)/r, -((e*x^r)/d)]*(-(b*n) + a*(-4 + r) + b*(-4 +
r)*Log[c*x^n])))/(16*d^2*r*(d + e*x^r))
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{e^2x^{2r}+2\,dex^r+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="fricas")
[Out] integral((b*x^3*log(c*x^n) + a*x^3)/(e^2*x^(2*r) + 2*d*e*x^r + d^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^3}{\left(ex^r+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^r + d)^2, x)
```

maple [A] time = 0.67, size = 0, normalized size = 0.00

$$\int \frac{(b\ln (c\,x^{n})+a)\,x^{3}}{(e\,x^{r}+d)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*ln(c*x^n)+a)/(e*x^r+d)^2,x)
[Out] int(x^3*(b*ln(c*x^n)+a)/(e*x^r+d)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log (cx^{n})+a\right)x^{3}}{(ex^{r}+d)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^r + d)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^{3}\,\left(a+b\,\ln (c\,x^{n})\right)}{(d+e\,x^{r})^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*log(c*x^n)))/(d + e*x^r)^2,x)
[Out] int((x^3*(a + b*log(c*x^n)))/(d + e*x^r)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3}\left(a+b\log (cx^{n})\right)}{(d+ex^{r})^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(d+e*x**r)**2,x)
[Out] Integral(x**3*(a + b*log(c*x**n))/(d + e*x**r)**2, x)
```

3.414 $\int \frac{x(a+b\log(cx^n))}{(d+ex^r)^2}\,dx$

Optimal. Leaf size=24

$$\operatorname{Int}\left(\frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2},x\right)$$

```
[Out] Unintegrable(x*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] Defer[Int][(x*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx=\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Mathematica [A] time = 0.24, size = 140, normalized size = 5.83

$$\frac{x^2\left(-bn(r-2)\left(d+ex^r\right){}_3F_2\left(1,\frac{2}{r},\frac{2}{r};1+\frac{2}{r},1+\frac{2}{r};-\frac{ex^r}{d}\right)+2\left(d+ex^r\right){}_2F_1\left(1,\frac{2}{r};\frac{r+2}{r};-\frac{ex^r}{d}\right)\left(a(r-2)+b(r-2)\log\ldots\right.\right.}{4d^2r\left(d+ex^r\right)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] (x^2*(-(b*n*(-2 + r)*(d + e*x^r)*HypergeometricPFQ[{1, 2/r, 2/r}, {1 + 2/r,
 1 + 2/r}, -((e*x^r)/d)]) + 4*d*(a + b*Log[c*x^n]) + 2*(d + e*x^r)*Hypergeo
metric2F1[1, 2/r, (2 + r)/r, -((e*x^r)/d)]*(-(b*n) + a*(-2 + r) + b*(-2 + r
)*Log[c*x^n])))/(4*d^2*r*(d + e*x^r))
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{bx\log\left(cx^n\right)+ax}{e^2x^{2r}+2\,dex^r+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x*log(c*x^n) + a*x)/(e^2*x^(2*r) + 2*d*e*x^r + d^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x}{\left(ex^r+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^r + d)^2, x)
```

maple [A] time = 0.74, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n)+a)\,x}{(e\,x^r+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*ln(c*x^n)+a)/(e*x^r+d)^2,x)
[Out] int(x*(b*ln(c*x^n)+a)/(e*x^r+d)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log(cx^n)+a\right)x}{(ex^r+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^r + d)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{\left(d+e\,x^r\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*log(c*x^n)))/(d + e*x^r)^2,x)
[Out] int((x*(a + b*log(c*x^n)))/(d + e*x^r)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(a+b\log(cx^n)\right)}{(d+ex^r)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(d+e*x**r)**2,x)
[Out] Integral(x*(a + b*log(c*x**n))/(d + e*x**r)**2, x)
```

3.415 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^2}\,dx$

Optimal. Leaf size=102

$$-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2r}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^2r\left(d+ex^r\right)}+\frac{bn\text{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{d^2r^2}+\frac{bn\log\left(d+ex^r\right)}{d^2r^2}$$

```
[Out] -e*x^r*(a+b*ln(c*x^n))/d^2/r/(d+e*x^r)-(a+b*ln(c*x^n))*ln(1+d/e/(x^r))/d^2/
r+b*n*ln(d+e*x^r)/d^2/r^2+b*n*polylog(2,-d/e/(x^r))/d^2/r^2
```

Rubi [A] time = 0.23, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2349, 2345, 2391, 2335, 260}

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^2r^2}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^2r\left(d+ex^r\right)}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2r}+\frac{bn\log\left(d+ex^r\right)}{d^2r^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^2),x]
```

```
[Out] -((e*x^r*(a + b*Log[c*x^n]))/(d^2*r*(d + e*x^r))) - ((a + b*Log[c*x^n])*Log
[1 + d/(e*x^r)])/(d^2*r) + (b*n*Log[d + e*x^r])/(d^2*r^2) + (b*n*PolyLog[2,
 -(d/(e*x^r))])/(d^2*r^2)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^2}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx}{d} - \frac{e\int \frac{x^{-1+r}(a+b\log(cx^n))}{(d+ex^r)^2}\,dx}{d}$$

$$= -\frac{ex^r(a+b\log(cx^n))}{d^2r(d+ex^r)} - \frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} + \frac{(bn)\int \frac{\log\left(1+\frac{dx^{-r}}{e}\right)}{x}\,dx}{d^2r} + \frac{(ben)\int}{d}$$

$$= -\frac{ex^r(a+b\log(cx^n))}{d^2r(d+ex^r)} - \frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} + \frac{bn\log(d+ex^r)}{d^2r^2} + \frac{bn\mathrm{Li}_2\left(-\frac{dx^{-}}{e}\right.}{d^2r^2}$$

Mathematica [A] time = 0.38, size = 132, normalized size = 1.29

$$\frac{\frac{dr(a+b\log(cx^n))}{d+ex^r} - ar\log(d-dx^r) + br(n\log(x)-\log(cx^n))\log(d-dx^r) + bn\left(\mathrm{Li}_2\left(\frac{ex^r}{d}+1\right) + \left(\log\left(-\frac{ex^r}{d}\right) - r\log(\right.\right.}{d^2r^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^2),x]
```

```
[Out] ((d*r*(a + b*Log[c*x^n]))/(d + e*x^r) + b*n*Log[d - d*x^r] - a*r*Log[d - d*
x^r] + b*r*(n*Log[x] - Log[c*x^n])*Log[d - d*x^r] + b*n*((r^2*Log[x]^2)/2 +
 (-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/
d]))/(d^2*r^2)
```

fricas [B] time = 0.44, size = 214, normalized size = 2.10

$$bdnr^2\log(x)^2 + 2\,bdr\log(c) + 2\,adr + \left(benr^2\log(x)^2 + 2\left(ber^2\log(c) - benr + aer^2\right)\log(x)\right)x^r - 2\,(benx^r + bdn)\mathrm{I}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(b*d*n*r^2*log(x)^2 + 2*b*d*r*log(c) + 2*a*d*r + (b*e*n*r^2*log(x)^2 +
2*(b*e*r^2*log(c) - b*e*n*r + a*e*r^2)*log(x))*x^r - 2*(b*e*n*x^r + b*d*n)*
dilog(-(e*x^r + d)/d + 1) - 2*(b*d*r*log(c) - b*d*n + a*d*r + (b*e*r*log(c)
 - b*e*n + a*e*r)*x^r)*log(e*x^r + d) + 2*(b*d*r^2*log(c) + a*d*r^2)*log(x)
 - 2*(b*e*n*r*x^r*log(x) + b*d*n*r*log(x))*log((e*x^r + d)/d))/(d^2*e*r^2*x
^r + d^3*r^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{(ex^r+d)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x), x)
```

maple [C] time = 0.30, size = 715, normalized size = 7.01

$$\frac{i\pi b\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2}{2(e\,x^r+d)\,dr} + \frac{i\pi b\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)^2}{2(e\,x^r+d)\,dr} + \frac{i\pi b\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2\ln(x^r)}{2d^2r} - \frac{i\pi b\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ic}{2d^2r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^r+d)^2,x)
```

```
[Out] -1/2*I/r*b*Pi*csgn(I*c*x^n)^3/d/(e*x^r+d)-1/2*I/r*b*Pi*csgn(I*c*x^n)^3/d^2*
ln(x^r)+1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*ln(x^r)+1/2*I/r*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2/d^2*ln(x^r)+1/2*b/d^2*n*ln(x)^2+1/2*I/r*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2/d/(e*x^r+d)-b/r/d/(e*x^r+d)*n*ln(x)-b/r*n/d^2*ln(x)*
ln((e*x^r+d)/d)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*ln(e*x^r+d)+1/
2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*ln(e*x^r+d)+1/r*a/d^2*ln
(x^r)-1/r*a/d^2*ln(e*x^r+d)+1/r*a/d/(e*x^r+d)-1/2*I/r*b*Pi*csgn(I*c*x^n)^2*
csgn(I*c)/d^2*ln(e*x^r+d)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/
d/(e*x^r+d)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*ln(x^r)-b/
r/d^2*ln(x^r)*n*ln(x)+b/r/d^2*ln(e*x^r+d)*n*ln(x)+1/2*I/r*b*Pi*csgn(I*c*x^n
)^3/d^2*ln(e*x^r+d)-b/r*n*e/d^2*ln(x)*x^r/(e*x^r+d)+1/2*I/r*b*Pi*csgn(I*c*x
^n)^2*csgn(I*c)/d/(e*x^r+d)-b/r^2*n/d^2*dilog((e*x^r+d)/d)+1/r*b*ln(c)/d^2*
ln(x^r)-1/r*b*ln(c)/d^2*ln(e*x^r+d)+1/r*b*ln(c)/d/(e*x^r+d)+b/r/d^2*ln(x^r)
*ln(x^n)-b/r/d^2*ln(e*x^r+d)*ln(x^n)+b/r/d/(e*x^r+d)*ln(x^n)+b*n*ln(e*x^r+d
)/d^2/r^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{1}{derx^r + d^2r} + \frac{\log(x)}{d^2} - \frac{\log\left(\frac{ex^r+d}{e}\right)}{d^2r}\right) + b\int \frac{\log(c) + \log(x^n)}{e^2xx^{2r} + 2\,dexx^r + d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] a*(1/(d*e*r*x^r + d^2*r) + log(x)/d^2 - log((e*x^r + d)/e)/(d^2*r)) + b*int
egrate((log(c) + log(x^n))/(e^2*x*x^(2*r) + 2*d*e*x*x^r + d^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\ln\left(c\,x^n\right)}{x\,\left(d + e\,x^r\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^r)^2),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^r)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

3.416 $\int \frac{a+b\log(cx^n)}{x^3(d+ex^r)^2}\,dx$

Optimal. Leaf size=26

$$\operatorname{Int}\left(\frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)^2},x\right)$$

[Out] Unintegrable((a+b*ln(c*x^n))/x^3/(d+e*x^r)^2,x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^r)^2),x]

[Out] Defer[Int][(a + b*Log[c*x^n])/(x^3*(d + e*x^r)^2), x]

Rubi steps

$$\int \frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)^2}\,dx=\int \frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)^2}\,dx$$

Mathematica [A] time = 3.16, size = 205, normalized size = 7.88

$$\frac{4ben(r+2)x^r\left(d+ex^r\right){}_3F_2\left(1,1-\frac{2}{r},1-\frac{2}{r};2-\frac{2}{r},2-\frac{2}{r};-\frac{ex^r}{d}\right)-(r-2)\left(4ex^r\left(d+ex^r\right){}_2F_1\left(1,\frac{r-2}{r};2-\frac{2}{r};-\frac{ex^r}{d}\right)\left(a(r\right.\right.}{4d^3(r-2)^2r}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^r)^2),x]

[Out] (4*b*e*n*(2 + r)*x^r*(d + e*x^r)*HypergeometricPFQ[{1, 1 - 2/r, 1 - 2/r}, {2 - 2/r, 2 - 2/r}, -((e*x^r)/d)] - (-2 + r)*(4*e*x^r*(d + e*x^r)*Hypergeometric2F1[1, (-2 + r)/r, 2 - 2/r, -((e*x^r)/d)]*(-(b*n) + a*(2 + r) + b*(2 + r)*Log[c*x^n]) + d*(-2 + r)*(b*n*r*(d + e*x^r) + 2*a*(d*r + e*(2 + r)*x^r) + 2*b*(d*r + e*(2 + r)*x^r)*Log[c*x^n])))/(4*d^3*(-2 + r)^2*r*x^2*(d + e*x^r))

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^2x^3x^{2r}+2\,dex^3x^r+d^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r)^2,x, algorithm="fricas")

[Out] integral((b*log(c*x^n) + a)/(e^2*x^3*x^(2*r) + 2*d*e*x^3*x^r + d^2*x^3), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^r+d\right)^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r)^2,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x^3), x)
```

maple [A] time = 0.67, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^{n}\right)+a}{\left(e\,x^{r}+d\right)^{2} x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^3/(e*x^r+d)^2,x)
[Out] int((b*ln(c*x^n)+a)/x^3/(e*x^r+d)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex^{r}+d\right)^{2}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r)^2,x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{a+b\,\ln\left(c\,x^{n}\right)}{x^{3}\,\left(d+e\,x^{r}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^3*(d + e*x^r)^2),x)
[Out] int((a + b*log(c*x^n))/(x^3*(d + e*x^r)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(d+e*x**r)**2,x)
[Out] Timed out
```

3.417 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex^r)^2}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2},x\right)$$

```
[Out] Unintegrable(x^2*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] Defer[Int][(x^2*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx=\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Mathematica [A] time = 0.25, size = 140, normalized size = 5.38

$$\frac{x^3\left(-bn(r-3)\left(d+ex^r\right)\,{}_3F_2\left(1,\frac{3}{r},\frac{3}{r};1+\frac{3}{r},1+\frac{3}{r};-\frac{ex^r}{d}\right)+3\left(d+ex^r\right)\,{}_2F_1\left(1,\frac{3}{r};\frac{r+3}{r};-\frac{ex^r}{d}\right)\left(a(r-3)+b(r-3)\log(c\right.\right.}{9d^2r\left(d+ex^r\right)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] (x^3*(-(b*n*(-3 + r)*(d + e*x^r)*HypergeometricPFQ[{1, 3/r, 3/r}, {1 + 3/r,
 1 + 3/r}, -((e*x^r)/d)]) + 9*d*(a + b*Log[c*x^n]) + 3*(d + e*x^r)*Hypergeo
metric2F1[1, 3/r, (3 + r)/r, -((e*x^r)/d)]*(-(b*n) + a*(-3 + r) + b*(-3 + r
)*Log[c*x^n])))/(9*d^2*r*(d + e*x^r))
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\log\left(cx^n\right)+ax^2}{e^2x^{2r}+2\,dex^r+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(e^2*x^(2*r) + 2*d*e*x^r + d^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)x^2}{\left(ex^r+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^r + d)^2, x)
```

maple [A] time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^n)+a)\,x^2}{(e\,x^r+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*ln(c*x^n)+a)/(e*x^r+d)^2,x)
[Out] int(x^2*(b*ln(c*x^n)+a)/(e*x^r+d)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log(cx^n)+a\right)x^2}{(ex^r+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^r + d)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^2\,\left(a+b\,\ln(c\,x^n)\right)}{(d+e\,x^r)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*log(c*x^n)))/(d + e*x^r)^2,x)
[Out] int((x^2*(a + b*log(c*x^n)))/(d + e*x^r)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2\left(a+b\log(cx^n)\right)}{(d+ex^r)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(d+e*x**r)**2,x)
[Out] Integral(x**2*(a + b*log(c*x**n))/(d + e*x**r)**2, x)
```

3.418 $\int \frac{a+b\log(cx^n)}{(d+ex^r)^2}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{a+b\log(cx^n)}{(d+ex^r)^2},x\right)$$

```
[Out] Unintegrable((a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\log(cx^n)}{(d+ex^r)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^r)^2,x]
[Out] Defer[Int][(a + b*Log[c*x^n])/(d + e*x^r)^2, x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex^r)^2}\,dx = \int \frac{a+b\log(cx^n)}{(d+ex^r)^2}\,dx$$

Mathematica [A] time = 2.62, size = 161, normalized size = 7.00

$$\frac{x\left(-bn(r-1)(d+ex^r)\,{}_3F_2\left(1,\frac{1}{r},\frac{1}{r};1+\frac{1}{r},1+\frac{1}{r};-\frac{ex^r}{d}\right)+aerx^r\,{}_2F_1\left(2,\frac{1}{r};1+\frac{1}{r};-\frac{ex^r}{d}\right)+adr\,{}_2F_1\left(2,\frac{1}{r};1+\frac{1}{r};-\frac{ex^r}{d}\right)-\right.}{d^2r(d+ex^r)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^r)^2,x]
[Out] (x*(a*d*r*Hypergeometric2F1[2, r^(-1), 1 + r^(-1), -((e*x^r)/d)] + a*e*r*x^
r*Hypergeometric2F1[2, r^(-1), 1 + r^(-1), -((e*x^r)/d)] - b*n*(-1 + r)*(d
+ e*x^r)*HypergeometricPFQ[{1, r^(-1), r^(-1)}, {1 + r^(-1), 1 + r^(-1)}, -
((e*x^r)/d)] + b*d*Log[c*x^n] - b*(d + e*x^r)*Hypergeometric2F1[1, r^(-1),
1 + r^(-1), -((e*x^r)/d)]*(n - (-1 + r)*Log[c*x^n])))/(d^2*r*(d + e*x^r))
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log(cx^n)+a}{e^2x^{2r}+2dex^r+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="fricas")
[Out] integral((b*log(c*x^n) + a)/(e^2*x^(2*r) + 2*d*e*x^r + d^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{(ex^r+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)/(e*x^r + d)^2, x)
```

maple [A] time = 0.69, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^{n}\right)+a}{\left(e\,x^{r}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/(e*x^r+d)^2,x)
[Out] int((b*ln(c*x^n)+a)/(e*x^r+d)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex^{r}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)/(e*x^r + d)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{a+b\,\ln\left(c\,x^{n}\right)}{\left(d+e\,x^{r}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(d + e*x^r)^2,x)
[Out] int((a + b*log(c*x^n))/(d + e*x^r)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\log\left(cx^{n}\right)}{\left(d+ex^{r}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e*x**r)**2,x)
[Out] Integral((a + b*log(c*x**n))/(d + e*x**r)**2, x)
```

3.419 $\int \frac{a+b\log(cx^n)}{x^2(d+ex^r)^2}\,dx$

Optimal. Leaf size=26

$$\operatorname{Int}\left(\frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)^2},x\right)$$

```
[Out] Unintegrable((a+b*ln(c*x^n))/x^2/(d+e*x^r)^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^r)^2),x]
```

```
[Out] Defer[Int][(a + b*Log[c*x^n])/(x^2*(d + e*x^r)^2), x]
```

Rubi steps

$$\int \frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)^2}\,dx=\int \frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)^2}\,dx$$

Mathematica [A] time = 0.20, size = 135, normalized size = 5.19

$$\frac{-bn(r+1)\left(d+ex^r\right)\,{}_3F_2\left(1,-\frac{1}{r},-\frac{1}{r};1-\frac{1}{r},1-\frac{1}{r};-\frac{ex^r}{d}\right)-\left(d+ex^r\right)\,{}_2F_1\left(1,-\frac{1}{r};\frac{r-1}{r};-\frac{ex^r}{d}\right)\left(ar+a+b(r+1)\log\left(cx^n\right.\right.}{d^2rx\left(d+ex^r\right)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^r)^2),x]
```

```
[Out] (-(b*n*(1 + r)*(d + e*x^r)*HypergeometricPFQ[{1, -r^(-1), -r^(-1)}, {1 - r^
(-1), 1 - r^(-1)}, -((e*x^r)/d)]) + d*(a + b*Log[c*x^n]) - (d + e*x^r)*Hype
rgeometric2F1[1, -r^(-1), (-1 + r)/r, -((e*x^r)/d)]*(a - b*n + a*r + b*(1 +
 r)*Log[c*x^n]))/(d^2*r*x*(d + e*x^r))
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^2x^2x^{2\,r}+2\,dex^2x^r+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^2*x^(2*r) + 2*d*e*x^2*x^r + d^2*x^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^r+d\right)^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x^2), x)
```

maple [A] time = 0.79, size = 0, normalized size = 0.00

$$\int \frac{b \ln \left(c\,x^{n}\right)+a}{\left(e\,x^{r}+d\right)^{2} x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x^2/(e*x^r+d)^2,x)
[Out] int((b*ln(c*x^n)+a)/x^2/(e*x^r+d)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b \log \left(cx^{n}\right)+a}{\left(ex^{r}+d\right)^{2} x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r)^2,x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{a+b\,\ln\left(c\,x^{n}\right)}{x^{2}\,\left(d+e\,x^{r}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x^2*(d + e*x^r)^2),x)
[Out] int((a + b*log(c*x^n))/(x^2*(d + e*x^r)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b \log \left(cx^{n}\right)}{x^{2}\left(d+ex^{r}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(d+e*x**r)**2,x)
[Out] Integral((a + b*log(c*x**n))/(x**2*(d + e*x**r)**2), x)
```

3.420 $\int \frac{a+b\log(cx^n)}{x(c-x^{-n})}\,dx$

Optimal. Leaf size=37

$$\frac{a\log(1-cx^n)}{cn}-\frac{b\text{Li}_2(1-cx^n)}{cn}$$

```
[Out] a*ln(1-c*x^n)/c/n-b*polylog(2,1-c*x^n)/c/n
```

Rubi [A] time = 0.14, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2343, 2333, 2316, 2315}

$$\frac{a\log(1-cx^n)}{cn}-\frac{b\text{PolyLog}(2,1-cx^n)}{cn}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(c - x^(-n))),x]
```

```
[Out] (a*Log[1 - c*x^n])/(c*n) - (b*PolyLog[2, 1 - c*x^n])/(c*n)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2316

```
Int[((a_.) + Log[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[
((a + b*Log[-((c*d)/e)])*Log[d + e*x])/e, x] + Dist[b, Int[Log[-((e*x)/d)]/
(d + e*x), x], x] /; FreeQ[{a, b, c, d, e}, x] && GtQ[-((c*d)/e), 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx^n)}{x(c-x^{-n})}\,dx &= \frac{\text{Subst}\left(\int \frac{a+b\log(cx)}{\left(c-\frac{1}{x}\right)x}\,dx,x,x^n\right)}{n}\\
&= \frac{\text{Subst}\left(\int \frac{a+b\log(cx)}{-1+cx}\,dx,x,x^n\right)}{n}\\
&= \frac{a\log(1-cx^n)}{cn}+\frac{b\,\text{Subst}\left(\int \frac{\log(cx)}{-1+cx}\,dx,x,x^n\right)}{n}\\
&= \frac{a\log(1-cx^n)}{cn}-\frac{b\text{Li}_2(1-cx^n)}{cn}
\end{aligned}$$

Mathematica [A] time = 0.02, size = 37, normalized size = 1.00

$$\frac{\log(1-cx^n)\left(a+b\log(cx^n)\right)+b\text{Li}_2(cx^n)}{cn}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(c - x^(-n))),x]
```

```
[Out] ((a + b*Log[c*x^n])*Log[1 - c*x^n] + b*PolyLog[2, c*x^n])/(c*n)
```

fricas [A] time = 0.44, size = 45, normalized size = 1.22

$$\frac{bn\log(-cx^n+1)\log(x)+b\text{Li}_2(cx^n)+\left(b\log(c)+a\right)\log(cx^n-1)}{cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(c-1/(x^n)),x, algorithm="fricas")
```

```
[Out] (b*n*log(-c*x^n + 1)*log(x) + b*dilog(c*x^n) + (b*log(c) + a)*log(c*x^n - 1
))/(c*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\log(cx^n)+a}{\left(c-\frac{1}{x^n}\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(c-1/(x^n)),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((c - 1/x^n)*x), x)
```

maple [A] time = 0.04, size = 33, normalized size = 0.89

$$\frac{a\ln(cx^n-1)}{cn}-\frac{b\,\text{dilog}(cx^n)}{cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(c-1/(x^n)),x)
```

```
[Out] 1/n*a/c*ln(c*x^n-1)-1/n*b/c*dilog(c*x^n)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b\int\frac{x^n\log(c)+x^n\log(x^n)}{cxx^n-x}\,dx+\frac{a\log\left(\frac{cx^n-1}{c}\right)}{cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(c-1/(x^n)),x, algorithm="maxima")
```

```
[Out] b*integrate((x^n*log(c) + x^n*log(x^n))/(c*x*x^n - x), x) + a*log((c*x^n -
1)/c)/(c*n)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int\frac{a+b\,\ln(cx^n)}{x\left(c-\frac{1}{x^n}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(c - 1/x^n)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(c - 1/x^n)), x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(c-1/(x**n)),x)
```

```
[Out] Exception raised: TypeError
```

3.421 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=152

$$d^3\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{3d^2ex^r\left(a+b\log\left(cx^n\right)\right)}{r}+\frac{3de^2x^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r}+\frac{e^3x^{3r}\left(a+b\log\left(cx^n\right)\right)}{3r}-\frac{1}{2}bd^3n$$

```
[Out] -3*b*d^2*e*n*x^r/r^2-3/4*b*d*e^2*n*x^(2*r)/r^2-1/9*b*e^3*n*x^(3*r)/r^2-1/2*
b*d^3*n*ln(x)^2+3*d^2*e*x^r*(a+b*ln(c*x^n))/r+3/2*d*e^2*x^(2*r)*(a+b*ln(c*x
^n))/r+1/3*e^3*x^(3*r)*(a+b*ln(c*x^n))/r+d^3*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.15, antiderivative size = 124, normalized size of antiderivative = 0.82, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$\frac{1}{6}\left(\frac{18d^2ex^r}{r}+6d^3\log(x)+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^r}{r^2}-\frac{1}{2}bd^3n\log^2(x)-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^3}{9r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-3*b*d^2*e*n*x^r)/r^2 - (3*b*d*e^2*n*x^(2*r))/(4*r^2) - (b*e^3*n*x^(3*r))/
(9*r^2) - (b*d^3*n*Log[x]^2)/2 + (((18*d^2*e*x^r)/r + (9*d*e^2*x^(2*r))/r +
 (2*e^3*x^(3*r))/r + 6*d^3*Log[x])*(a + b*Log[c*x^n]))/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
```

```
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^3 \left(a+b\log\left(cx^n\right)\right)}{x}\,dx = \frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{ex^r\,(\ldots}{\ldots}$$

$$= \frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int \frac{ex^r(18\ldots}{\ldots}}{\ldots}$$

$$= \frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int \left(18d\ldots\right.}{\ldots}$$

$$= -\frac{3bd^2enx^r}{r^2}-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^{3r}}{9r^2}+\frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\,\mathrm{l}\ldots\right.$$

$$= -\frac{3bd^2enx^r}{r^2}-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^{3r}}{9r^2}-\frac{1}{2}bd^3n\log^2(x)+\frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}\ldots\right.$$

Mathematica [A] time = 0.34, size = 132, normalized size = 0.87

$$\frac{1}{36}\left(\frac{ex^r\left(6ar\left(18d^2+9dex^r+2e^2x^{2r}\right)-bn\left(108d^2+27dex^r+4e^2x^{2r}\right)\right)}{r^2}+\frac{18bd^3\log^2\left(cx^n\right)}{n}+\frac{6bex^r\log\left(cx^n\right)\left(18d^2\ldots\right.}{r}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] a*d^3*Log[x] + ((e*x^r*(6*a*r*(18*d^2 + 9*d*e*x^r + 2*e^2*x^(2*r)) - b*n*(1
08*d^2 + 27*d*e*x^r + 4*e^2*x^(2*r))))/r^2 + (6*b*e*x^r*(18*d^2 + 9*d*e*x^r
 + 2*e^2*x^(2*r))*Log[c*x^n])/r + (18*b*d^3*Log[c*x^n]^2)/n)/36
```

fricas [A] time = 0.43, size = 169, normalized size = 1.11

$$\frac{18\,bd^3nr^2\log(x)^2+4\left(3\,be^3nr\log(x)+3\,be^3r\log(c)-be^3n+3\,ae^3r\right)x^{3\,r}+27\left(2\,bde^2nr\log(x)+2\,bde^2r\log(c)-\ldots\right.}{36\,r\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/36*(18*b*d^3*n*r^2*log(x)^2 + 4*(3*b*e^3*n*r*log(x) + 3*b*e^3*r*log(c) -
b*e^3*n + 3*a*e^3*r)*x^(3*r) + 27*(2*b*d*e^2*n*r*log(x) + 2*b*d*e^2*r*log(c
) - b*d*e^2*n + 2*a*d*e^2*r)*x^(2*r) + 108*(b*d^2*e*n*r*log(x) + b*d^2*e*r*
log(c) - b*d^2*e*n + a*d^2*e*r)*x^r + 36*(b*d^3*r^2*log(c) + a*d^3*r^2)*log
(x))/r^2
```

giac [A] time = 0.30, size = 210, normalized size = 1.38

$$\frac{1}{2}\,bd^3n\log(x)^2+\frac{3\,bd^2nx^re\log(x)}{r}+bd^3\log(c)\log(x)+\frac{3\,bd^2x^re\log(c)}{r}+ad^3\log(x)+\frac{3\,bdnx^{2\,r}e^2\log(x)}{2\,r}-\frac{3\,bd^2nx^re}{r^2}+\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d^3*n*log(x)^2 + 3*b*d^2*n*x^r*e*log(x)/r + b*d^3*log(c)*log(x) + 3*b
*d^2*x^r*e*log(c)/r + a*d^3*log(x) + 3/2*b*d*n*x^(2*r)*e^2*log(x)/r - 3*b*d
^2*n*x^r*e/r^2 + 3*a*d^2*x^r*e/r + 3/2*b*d*x^(2*r)*e^2*log(c)/r + 1/3*b*n*x
^(3*r)*e^3*log(x)/r - 3/4*b*d*n*x^(2*r)*e^2/r^2 + 3/2*a*d*x^(2*r)*e^2/r + 1
/3*b*x^(3*r)*e^3*log(c)/r - 1/9*b*n*x^(3*r)*e^3/r^2 + 1/3*a*x^(3*r)*e^3/r
```

maple [C] time = 0.10, size = 693, normalized size = 4.56

$$\frac{a\,e^{3}x^{3r}}{3r}+\frac{\left(6d^{3}r\ln(x)+18d^{2}e\,x^{r}+9d\,e^{2}x^{2r}+2e^{3}x^{3r}\right)b\ln\left(x^{n}\right)}{6r}+\frac{b\,e^{3}x^{3r}\ln(c)}{3r}+b\,d^{3}\ln(c)\ln(x)+a\,d^{3}\ln(x)+\frac{3bd\,e^{2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^r+d)^3*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] 1/3/r*a*e^3*(x^r)^3+1/6*b*(2*e^3*(x^r)^3+6*d^3*r*ln(x)+9*d*e^2*(x^r)^2+18*d
^2*e*x^r)/r*ln(x^n)-1/6*I/r*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+1/2*I*Pi*b*d^3
*csgn(I*x^n)*csgn(I*c*x^n)^2*ln(x)+1/2*I*Pi*b*d^3*csgn(I*c)*csgn(I*c*x^n)^2
*ln(x)+b*d^3*ln(c)*ln(x)+a*d^3*ln(x)+3/2/r*ln(c)*b*d*e^2*(x^r)^2-3/4/r^2*b*
d*e^2*n*(x^r)^2+3*b*d^2*e/r*x^r*ln(c)-1/2*I*Pi*b*d^3*csgn(I*c*x^n)^3*ln(x)+
1/3/r*ln(c)*b*e^3*(x^r)^3-1/9/r^2*b*e^3*n*(x^r)^3+3/2/r*a*d*e^2*(x^r)^2+3*a
*d^2*e/r*x^r-3/4*I/r*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2
-3/2*I*Pi*b*d^2*e/r*x^r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+3/4*I/r*Pi*b*d*
e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+3/4*I/r*Pi*b*d*e^2*csgn(I*c*x^n)^2*
csgn(I*c)*(x^r)^2+3/2*I*Pi*b*d^2*e/r*x^r*csgn(I*x^n)*csgn(I*c*x^n)^2+3/2*I*
Pi*b*d^2*e/r*x^r*csgn(I*c)*csgn(I*c*x^n)^2-1/6*I/r*Pi*b*e^3*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*(x^r)^3-3*b*d^2*e*n/r^2*x^r-1/2*I*Pi*b*d^3*csgn(I*c)*c
sgn(I*x^n)*csgn(I*c*x^n)*ln(x)+1/6*I/r*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2
*(x^r)^3+1/6*I/r*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-3/4*I/r*Pi*b*d*
e^2*csgn(I*c*x^n)^3*(x^r)^2-3/2*I*Pi*b*d^2*e/r*x^r*csgn(I*c*x^n)^3-1/2*b*d^
3*n*ln(x)^2
```

maxima [A] time = 1.02, size = 172, normalized size = 1.13

$$\frac{be^{3}x^{3\,r}\log\left(cx^{n}\right)}{3\,r}+\frac{3\,bde^{2}x^{2\,r}\log\left(cx^{n}\right)}{2\,r}+\frac{3\,bd^{2}ex^{r}\log\left(cx^{n}\right)}{r}+\frac{bd^{3}\log\left(cx^{n}\right)^{2}}{2\,n}+ad^{3}\log(x)-\frac{be^{3}nx^{3\,r}}{9\,r^{2}}+\frac{ae^{3}x^{3\,r}}{3\,r}-\frac{3\,bde}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] 1/3*b*e^3*x^(3*r)*log(c*x^n)/r + 3/2*b*d*e^2*x^(2*r)*log(c*x^n)/r + 3*b*d^2
*e*x^r*log(c*x^n)/r + 1/2*b*d^3*log(c*x^n)^2/n + a*d^3*log(x) - 1/9*b*e^3*n
*x^(3*r)/r^2 + 1/3*a*e^3*x^(3*r)/r - 3/4*b*d*e^2*n*x^(2*r)/r^2 + 3/2*a*d*e^
2*x^(2*r)/r - 3*b*d^2*e*n*x^r/r^2 + 3*a*d^2*e*x^r/r
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(d+e\,x^{r}\right)^{3}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x,x)
```

```
[Out] int(((d + e*x^r)^3*(a + b*log(c*x^n)))/x, x)
```

sympy [A] time = 20.73, size = 286, normalized size = 1.88

$$\begin{cases} ad^3\log(x) + \frac{3ad^2ex^r}{r} + \frac{3ade^2x^{2r}}{2r} + \frac{ae^3x^{3r}}{3r} + \frac{bd^3n\log(x)^2}{2} + bd^3\log(c)\log(x) + \frac{3bd^2enx^r\log(x)}{r} - \frac{3bd^2enx^r}{r^2} + \frac{3bd^2ex^r\log(c)}{r} \\ (d+e)^3\left(\begin{cases} a\log(x) & \text{for } b=0 \\ -\left(-a-b\log(c)\right)\log(x) & \text{for } n=0 \\ \frac{\left(-a-b\log(cx^n)\right)^2}{2bn} & \text{otherwise} \end{cases}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Piecewise((a*d**3*log(x) + 3*a*d**2*e*x**r/r + 3*a*d*e**2*x**(2*r)/(2*r) +
a*e**3*x**(3*r)/(3*r) + b*d**3*n*log(x)**2/2 + b*d**3*log(c)*log(x) + 3*b*d
**2*e*n*x**r*log(x)/r - 3*b*d**2*e*n*x**r/r**2 + 3*b*d**2*e*x**r*log(c)/r +
 3*b*d*e**2*n*x**(2*r)*log(x)/(2*r) - 3*b*d*e**2*n*x**(2*r)/(4*r**2) + 3*b*
d*e**2*x**(2*r)*log(c)/(2*r) + b*e**3*n*x**(3*r)*log(x)/(3*r) - b*e**3*n*x*
*(3*r)/(9*r**2) + b*e**3*x**(3*r)*log(c)/(3*r), Ne(r, 0)), ((d + e)**3*Piec
ewise((a*log(x), Eq(b, 0)), (-(-a - b*log(c))*log(x), Eq(n, 0)), ((-a - b*l
og(c*x**n))**2/(2*b*n), True)), True))
```

3.422 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=104

$$d^2\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{2dex^r\left(a+b\log\left(cx^n\right)\right)}{r}+\frac{e^2x^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r}-\frac{1}{2}bd^2n\log^2(x)-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}$$

```
[Out] -2*b*d*e*n*x^r/r^2-1/4*b*e^2*n*x^(2*r)/r^2-1/2*b*d^2*n*ln(x)^2+2*d*e*x^r*(a
+b*ln(c*x^n))/r+1/2*e^2*x^(2*r)*(a+b*ln(c*x^n))/r+d^2*ln(x)*(a+b*ln(c*x^n))
```

Rubi [A] time = 0.13, antiderivative size = 87, normalized size of antiderivative = 0.84, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$\frac{1}{2}\left(2d^2\log(x)+\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^2n\log^2(x)-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-2*b*d*e*n*x^r)/r^2 - (b*e^2*n*x^(2*r))/(4*r^2) - (b*d^2*n*Log[x]^2)/2 + (
((4*d*e*x^r)/r + (e^2*x^(2*r))/r + 2*d^2*Log[x])*(a + b*Log[c*x^n]))/2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
```

```
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)^2\left(a+b\log\left(cx^n\right)\right)}{x}\,dx = \frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{ex^r\left(4d+ex^r\right)+2\ldots}{2rx}$$

$$=\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int\frac{ex^r(4d+ex^r)+2d^2r\log(x)}{x}}{2r}$$

$$=\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int\left(4dex^{-1+r}+e^2x^{-1+\ldots}\right.}{2r}$$

$$=-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}+\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\left(b\ldots\right.$$

$$=-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}-\frac{1}{2}bd^2n\log^2(x)+\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+\ldots\right.$$

Mathematica [A] time = 0.22, size = 90, normalized size = 0.87

$$\frac{1}{4}\left(\frac{ex^r\left(2ar\left(4d+ex^r\right)-bn\left(8d+ex^r\right)\right)}{r^2}+4ad^2\log(x)+\frac{2bd^2\log^2\left(cx^n\right)}{n}+\frac{2bex^r\log\left(cx^n\right)\left(4d+ex^r\right)}{r}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] ((e*x^r*(2*a*r*(4*d + e*x^r) - b*n*(8*d + e*x^r)))/r^2 + 4*a*d^2*Log[x] + (
2*b*e*x^r*(4*d + e*x^r)*Log[c*x^n])/r + (2*b*d^2*Log[c*x^n]^2)/n)/4
```

fricas [A] time = 0.42, size = 115, normalized size = 1.11

$$\frac{2\,bd^2nr^2\log(x)^2+\left(2\,be^2nr\log(x)+2\,be^2r\log(c)-be^2n+2\,ae^2r\right)x^{2\,r}+8\left(bdenr\log(x)+bder\log(c)-bden+a\ldots\right.}{4\,r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*d^2*n*r^2*log(x)^2 + (2*b*e^2*n*r*log(x) + 2*b*e^2*r*log(c) - b*e^
2*n + 2*a*e^2*r)*x^(2*r) + 8*(b*d*e*n*r*log(x) + b*d*e*r*log(c) - b*d*e*n +
 a*d*e*r)*x^r + 4*(b*d^2*r^2*log(c) + a*d^2*r^2)*log(x))/r^2
```

giac [A] time = 0.38, size = 140, normalized size = 1.35

$$\frac{1}{2}\,bd^2n\log(x)^2+\frac{2\,bdnx^re\log(x)}{r}+bd^2\log(c)\log(x)+\frac{2\,bdx^re\log(c)}{r}+ad^2\log(x)+\frac{bnx^{2\,r}e^2\log(x)}{2\,r}-\frac{2\,bdnx^re}{r^2}+\frac{2\,adx\ldots}{r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d^2*n*log(x)^2 + 2*b*d*n*x^r*e*log(x)/r + b*d^2*log(c)*log(x) + 2*b*d
*x^r*e*log(c)/r + a*d^2*log(x) + 1/2*b*n*x^(2*r)*e^2*log(x)/r - 2*b*d*n*x^r
*e/r^2 + 2*a*d*x^r*e/r + 1/2*b*x^(2*r)*e^2*log(c)/r - 1/4*b*n*x^(2*r)*e^2/r
^2 + 1/2*a*x^(2*r)*e^2/r
```

maple [C] time = 0.08, size = 487, normalized size = 4.68

$$-\frac{i\pi b\,d^{2}\operatorname{csgn}\left(ic\right)\operatorname{csgn}\left(ix^{n}\right)\operatorname{csgn}\left(ic\,x^{n}\right)\ln\left(x\right)}{2}+\frac{i\pi b\,d^{2}\operatorname{csgn}\left(ic\right)\operatorname{csgn}\left(ic\,x^{n}\right)^{2}\ln\left(x\right)}{2}+\frac{i\pi b\,d^{2}\operatorname{csgn}\left(ix^{n}\right)\operatorname{csgn}\left(ic\,x^{n}\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^r+d)^2*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] 1/2*b*(2*d^2*r*ln(x)+(x^r)^2*e^2+4*d*e*x^r)/r*ln(x^n)-1/2*I*Pi*ln(x)*b*d^2*
csgn(I*c*x^n)^3-1/4*I/r*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^
2-I/r*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+1/2*I*Pi*ln(x)*b*d^2
*csgn(I*x^n)*csgn(I*c*x^n)^2+I/r*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-I
/r*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+1/4*I/r*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^
2*(x^r)^2-1/4*I/r*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+1/2*I*Pi*ln(x)*b*d^2*csg
n(I*c*x^n)^2*csgn(I*c)+1/4*I/r*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-1
/2*I*Pi*ln(x)*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/r*Pi*b*d*e*csgn(I
*c*x^n)^2*csgn(I*c)*x^r-1/2*b*d^2*n*ln(x)^2+1/2/r*ln(c)*b*e^2*(x^r)^2+b*d^2
*ln(c)*ln(x)+1/2/r*a*e^2*(x^r)^2-1/4/r^2*b*e^2*n*(x^r)^2+2/r*b*d*e*x^r*ln(c
)+a*d^2*ln(x)+2/r*a*d*e*x^r-2*b*d*e*n/r^2*x^r
```

maxima [A] time = 1.24, size = 114, normalized size = 1.10

$$\frac{be^{2}x^{2r}\log\left(cx^{n}\right)}{2r}+\frac{2\,bdex^{r}\log\left(cx^{n}\right)}{r}+\frac{bd^{2}\log\left(cx^{n}\right)^{2}}{2n}+ad^{2}\log(x)-\frac{be^{2}nx^{2r}}{4r^{2}}+\frac{ae^{2}x^{2r}}{2r}-\frac{2\,bdenx^{r}}{r^{2}}+\frac{2\,adex^{r}}{r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] 1/2*b*e^2*x^(2*r)*log(c*x^n)/r + 2*b*d*e*x^r*log(c*x^n)/r + 1/2*b*d^2*log(c
*x^n)^2/n + a*d^2*log(x) - 1/4*b*e^2*n*x^(2*r)/r^2 + 1/2*a*e^2*x^(2*r)/r -
2*b*d*e*n*x^r/r^2 + 2*a*d*e*x^r/r
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(d+e\,x^r\right)}^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x,x)
```

```
[Out] int(((d + e*x^r)^2*(a + b*log(c*x^n)))/x, x)
```

sympy [A] time = 13.25, size = 199, normalized size = 1.91

$$\begin{cases} ad^{2}\log\left(x\right)+\frac{2adex^{r}}{r}+\frac{ae^{2}x^{2r}}{2r}+\frac{bd^{2}n\log\left(x\right)^{2}}{2}+bd^{2}\log\left(c\right)\log\left(x\right)+\frac{2bdenx^{r}\log\left(x\right)}{r}-\frac{2bdenx^{r}}{r^{2}}+\frac{2bdex^{r}\log\left(c\right)}{r}+\frac{be^{2}nx^{2r}\log}{2r} \\ \left(d+e\right)^{2}\left(\begin{cases} a\log\left(x\right) & \text{for}\: b=0 \\ -\left(-a-b\log\left(c\right)\right)\log\left(x\right) & \text{for}\: n=0 \\ \frac{\left(-a-b\log\left(cx^{n}\right)\right)^{2}}{2bn} & \text{otherwise} \end{cases}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Piecewise((a*d**2*log(x) + 2*a*d*e*x**r/r + a*e**2*x**(2*r)/(2*r) + b*d**2*
n*log(x)**2/2 + b*d**2*log(c)*log(x) + 2*b*d*e*n*x**r*log(x)/r - 2*b*d*e*n*
```

```
x**r/r**2 + 2*b*d*e*x**r*log(c)/r + b*e**2*n*x**(2*r)*log(x)/(2*r) - b*e**2
*n*x**(2*r)/(4*r**2) + b*e**2*x**(2*r)*log(c)/(2*r), Ne(r, 0)), ((d + e)**2
*Piecewise((a*log(x), Eq(b, 0)), (-(-a - b*log(c))*log(x), Eq(n, 0)), ((-a
- b*log(c*x**n))**2/(2*b*n), True)), True))
```

3.423 $\int \frac{(d+ex^r)(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=53

$$\frac{d(a+b\log(cx^n))^2}{2bn}+\frac{ex^r(a+b\log(cx^n))}{r}-\frac{benx^r}{r^2}$$

```
[Out] -b*e*n*x^r/r^2+e*x^r*(a+b*ln(c*x^n))/r+1/2*d*(a+b*ln(c*x^n))^2/b/n
```

Rubi [A] time = 0.08, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {14, 2351, 2301, 2304}

$$\frac{d(a+b\log(cx^n))^2}{2bn}+\frac{ex^r(a+b\log(cx^n))}{r}-\frac{benx^r}{r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -((b*e*n*x^r)/r^2) + (e*x^r*(a + b*Log[c*x^n]))/r + (d*(a + b*Log[c*x^n])^2
)/(2*b*n)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rubi steps

$$\begin{aligned}
\int \frac{(d+ex^r)(a+b\log(cx^n))}{x}\,dx &= \int \left(\frac{d(a+b\log(cx^n))}{x}+ex^{-1+r}(a+b\log(cx^n))\right)dx\\
&= d\int \frac{a+b\log(cx^n)}{x}\,dx+e\int x^{-1+r}(a+b\log(cx^n))\,dx\\
&= -\frac{benx^r}{r^2}+\frac{ex^r(a+b\log(cx^n))}{r}+\frac{d(a+b\log(cx^n))^2}{2bn}
\end{aligned}$$

Mathematica [A] time = 0.09, size = 54, normalized size = 1.02

$$\frac{ex^r(ar-bn)}{r^2}+ad\log(x)+\frac{bd\log^2\left(cx^n\right)}{2n}+\frac{bex^r\log\left(cx^n\right)}{r}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (e*(-(b*n) + a*r)*x^r)/r^2 + a*d*Log[x] + (b*e*x^r*Log[c*x^n])/r + (b*d*Log
[c*x^n]^2)/(2*n)
```

fricas [A] time = 0.41, size = 64, normalized size = 1.21

$$\frac{bdnr^2\log(x)^2+2\left(benr\log(x)+ber\log(c)-ben+aer\right)x^r+2\left(bdr^2\log(c)+adr^2\right)\log(x)}{2\,r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/2*(b*d*n*r^2*log(x)^2 + 2*(b*e*n*r*log(x) + b*e*r*log(c) - b*e*n + a*e*r)
*x^r + 2*(b*d*r^2*log(c) + a*d*r^2)*log(x))/r^2
```

giac [A] time = 0.37, size = 69, normalized size = 1.30

$$\frac{1}{2}\,bdn\log(x)^2+\frac{bnx^re\log(x)}{r}+bd\log(c)\log(x)+\frac{bx^re\log(c)}{r}+ad\log(x)-\frac{bnx^re}{r^2}+\frac{ax^re}{r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d*n*log(x)^2 + b*n*x^r*e*log(x)/r + b*d*log(c)*log(x) + b*x^r*e*log(c
)/r + a*d*log(x) - b*n*x^r*e/r^2 + a*x^r*e/r
```

maple [C] time = 0.07, size = 278, normalized size = 5.25

$$-\frac{i\pi bd\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln(x)}{2}+\frac{i\pi bd\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ic\,x^n\right)^2\ln(x)}{2}+\frac{i\pi bd\,\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)^2\ln(x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^r+d)*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] b*(d*r*ln(x)+e*x^r)/r*ln(x^n)+1/2*I*Pi*ln(x)*b*d*csgn(I*x^n)*csgn(I*c*x^n)^
2-1/2*I*csgn(I*c)*csgn(I*c*x^n)*csgn(I*x^n)*d*b*ln(x)*Pi-1/2*I*csgn(I*c*x^n
)^3*d*b*ln(x)*Pi+1/2*I*Pi*ln(x)*b*d*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I/r*Pi*b*
e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1/2*I/r*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*x^r-1/2*I/r*Pi*b*e*csgn(I*c*x^n)^3*x^r+1/2*I/r*Pi*b*e*csgn(I*c*x^
n)^2*csgn(I*c)*x^r-1/2*b*d*n*ln(x)^2+b*d*ln(c)*ln(x)+1/r*b*e*x^r*ln(c)+a*d*
ln(x)+1/r*x^r*a*e-b*e*n/r^2*x^r
```

maxima [A] time = 1.10, size = 56, normalized size = 1.06

$$\frac{bex^r\log\left(cx^n\right)}{r}+\frac{bd\log\left(cx^n\right)^2}{2\,n}+ad\log(x)-\frac{benx^r}{r^2}+\frac{aex^r}{r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] b*e*x^r*log(c*x^n)/r + 1/2*b*d*log(c*x^n)^2/n + a*d*log(x) - b*e*n*x^r/r^2
+ a*e*x^r/r
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{(d+e\,x^r)\,(a+b\,\ln(c\,x^n))}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)*(a + b*log(c*x^n)))/x,x)
```

```
[Out] int(((d + e*x^r)*(a + b*log(c*x^n)))/x, x)
```

sympy [A] time = 10.09, size = 112, normalized size = 2.11

$$\begin{cases} ad\log(x) + \frac{aex^r}{r} + \frac{bdn\log(x)^2}{2} + bd\log(c)\log(x) + \frac{benx^r\log(x)}{r} - \frac{benx^r}{r^2} + \frac{bex^r\log(c)}{r} & \text{for}\ r \neq 0 \\ (d+e)\left(\begin{cases} a\log(x) & \text{for}\ b = 0 \\ -\left(-a - b\log(c)\right)\log(x) & \text{for}\ n = 0 \\ \frac{\left(-a-b\log(cx^n)\right)^2}{2bn} & \text{otherwise} \end{cases}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Piecewise((a*d*log(x) + a*e*x**r/r + b*d*n*log(x)**2/2 + b*d*log(c)*log(x)
+ b*e*n*x**r*log(x)/r - b*e*n*x**r/r**2 + b*e*x**r*log(c)/r, Ne(r, 0)), ((d
 + e)*Piecewise((a*log(x), Eq(b, 0)), (-(-a - b*log(c))*log(x), Eq(n, 0)),
((-a - b*log(c*x**n))**2/(2*b*n), True)), True))
```

3.424 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx$

Optimal. Leaf size=54

$$\frac{bn\text{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{dr^2}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{dr}$$

```
[Out] -(a+b*ln(c*x^n))*ln(1+d/e/(x^r))/d/r+b*n*polylog(2,-d/e/(x^r))/d/r^2
```

Rubi [A] time = 0.08, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2345, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{dr^2}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{dr}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)),x]
```

```
[Out] -(((a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d*r)) + (b*n*PolyLog[2, -(d/(e*x
^r))])/(d*r^2)
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log\left(cx^n\right)}{x\left(d+ex^r\right)}\,dx &= -\frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{dx^{-r}}{e}\right)}{dr}+\frac{(bn)\int\frac{\log\left(1+\frac{dx^{-r}}{e}\right)}{x}\,dx}{dr}\\ &= -\frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{dx^{-r}}{e}\right)}{dr}+\frac{bn\text{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{dr^2}\end{aligned}$$

Mathematica [A] time = 0.11, size = 108, normalized size = 2.00

$$\frac{-2r\log\left(d-dx^r\right)\left(a+b\log\left(cx^n\right)\right)+2bn\text{Li}_2\left(\frac{ex^r}{d}+1\right)+2bnr\log(x)\left(\log\left(d-dx^r\right)-\log\left(d+ex^r\right)\right)+2bn\log\left(-\frac{ex}{d}\right.}{2dr^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)),x]
```

```
[Out] (b*n*r^2*Log[x]^2 - 2*r*(a + b*Log[c*x^n])*Log[d - d*x^r] + 2*b*n*r*Log[x]*
(Log[d - d*x^r] - Log[d + e*x^r]) + 2*b*n*Log[-((e*x^r)/d)]*Log[d + e*x^r]
+ 2*b*n*PolyLog[2, 1 + (e*x^r)/d])/(2*d*r^2)
```

fricas [A] time = 0.44, size = 93, normalized size = 1.72

$$\frac{bnr^2\log(x)^2 - 2\,bnr\log(x)\log\left(\frac{ex^r+d}{d}\right) - 2\,bn\mathrm{Li}_2\left(-\frac{ex^r+d}{d}+1\right) - 2\left(br\log(c)+ar\right)\log\left(ex^r+d\right) + 2\left(br^2\log(c)\right.}{2\,dr^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] 1/2*(b*n*r^2*log(x)^2 - 2*b*n*r*log(x)*log((e*x^r + d)/d) - 2*b*n*dilog(-(e
*x^r + d)/d + 1) - 2*(b*r*log(c) + a*r)*log(e*x^r + d) + 2*(b*r^2*log(c) +
a*r^2)*log(x))/(d*r^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right)+a}{(ex^r+d)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x), x)
```

maple [C] time = 0.06, size = 451, normalized size = 8.35

$$\frac{bn\ln(x)^2}{2d} - \frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln\left(x^r\right)}{2dr} + \frac{i\pi b\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\,x^n\right)\ln\left(e\,x^r+d\right)}{2dr} + \frac{i\pi b\,\mathrm{c}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^r+d),x)
```

```
[Out] -b/d*n/r*ln(x)*ln(x^r)+b/d/r*ln(x^n)*ln(x^r)+b/d*n/r*ln(x)*ln(e*x^r+d)-b/d/
r*ln(x^n)*ln(e*x^r+d)+1/2*b/d*n*ln(x)^2-b/d*n/r*ln(x)*ln(1/d*e*x^r+1)-b/r^2
*n/d*polylog(2,-1/d*e*x^r)+1/2*I*Pi*b/d/r*csgn(I*c*x^n)^3*ln(e*x^r+d)-1/2*I
*Pi*b/d/r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)*ln(x^r)-1/2*I*Pi*b/d/r*csgn(I
*c*x^n)^3*ln(x^r)+1/2*I*Pi*b/d/r*csgn(I*c)*csgn(I*c*x^n)^2*ln(x^r)+1/2*I*Pi
*b/d/r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)*ln(e*x^r+d)+1/2*I*Pi*b/d/r*csgn(
I*x^n)*csgn(I*c*x^n)^2*ln(x^r)-1/2*I*Pi*b/d/r*csgn(I*x^n)*csgn(I*c*x^n)^2*l
n(e*x^r+d)-1/2*I*Pi*b/d/r*csgn(I*c)*csgn(I*c*x^n)^2*ln(e*x^r+d)+b/d/r*ln(c)
*ln(x^r)-b/d/r*ln(c)*ln(e*x^r+d)+a/d/r*ln(x^r)-a/d/r*ln(e*x^r+d)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{\log(x)}{d} - \frac{\log\left(\frac{ex^r+d}{e}\right)}{dr}\right) + b\int \frac{\log(c)+\log\left(x^n\right)}{exx^r+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] a*(log(x)/d - log((e*x^r + d)/e)/(d*r)) + b*integrate((log(c) + log(x^n))/(
e*x*x^r + d*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a+b\,\ln\left(c\,x^n\right)}{x\,\left(d+e\,x^r\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^r)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^r)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r),x)
```

```
[Out] Timed out
```

3.425 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^2}\,dx$

Optimal. Leaf size=102

$$-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2r}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^2r\left(d+ex^r\right)}+\frac{bn\text{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{d^2r^2}+\frac{bn\log\left(d+ex^r\right)}{d^2r^2}$$

```
[Out] -e*x^r*(a+b*ln(c*x^n))/d^2/r/(d+e*x^r)-(a+b*ln(c*x^n))*ln(1+d/e/(x^r))/d^2/
r+b*n*ln(d+e*x^r)/d^2/r^2+b*n*polylog(2,-d/e/(x^r))/d^2/r^2
```

Rubi [A] time = 0.23, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2349, 2345, 2391, 2335, 260}

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^2r^2}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^2r\left(d+ex^r\right)}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2r}+\frac{bn\log\left(d+ex^r\right)}{d^2r^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^2),x]
```

```
[Out] -((e*x^r*(a + b*Log[c*x^n]))/(d^2*r*(d + e*x^r))) - ((a + b*Log[c*x^n])*Log
[1 + d/(e*x^r)])/(d^2*r) + (b*n*Log[d + e*x^r])/(d^2*r^2) + (b*n*PolyLog[2,
 -(d/(e*x^r))])/(d^2*r^2)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^2}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx}{d} - \frac{e\int \frac{x^{-1+r}(a+b\log(cx^n))}{(d+ex^r)^2}\,dx}{d}$$

$$= -\frac{ex^r(a+b\log(cx^n))}{d^2r(d+ex^r)} - \frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} + \frac{(bn)\int \frac{\log\left(1+\frac{dx^{-r}}{e}\right)}{x}\,dx}{d^2r} + \frac{(ben)\int}{d}$$

$$= -\frac{ex^r(a+b\log(cx^n))}{d^2r(d+ex^r)} - \frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} + \frac{bn\log(d+ex^r)}{d^2r^2} + \frac{bn\mathrm{Li}_2\left(-\frac{dx^{-}}{e}\right.}{d^2r^2}$$

Mathematica [A] time = 0.30, size = 132, normalized size = 1.29

$$\frac{\frac{dr(a+b\log(cx^n))}{d+ex^r} - ar\log(d-dx^r) + br\left(n\log(x)-\log(cx^n)\right)\log(d-dx^r) + bn\left(\mathrm{Li}_2\left(\frac{ex^r}{d}+1\right) + \left(\log\left(-\frac{ex^r}{d}\right) - r\log(\right.\right.}{d^2r^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^2),x]
```

```
[Out] ((d*r*(a + b*Log[c*x^n]))/(d + e*x^r) + b*n*Log[d - d*x^r] - a*r*Log[d - d*
x^r] + b*r*(n*Log[x] - Log[c*x^n])*Log[d - d*x^r] + b*n*((r^2*Log[x]^2)/2 +
 (-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/
d]))/(d^2*r^2)
```

fricas [B] time = 0.42, size = 214, normalized size = 2.10

$$bdnr^2\log(x)^2 + 2\,bdr\log(c) + 2\,adr + \left(benr^2\log(x)^2 + 2\left(ber^2\log(c) - benr + aer^2\right)\log(x)\right)x^r - 2\,(benx^r + bdn)\mathrm{I}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(b*d*n*r^2*log(x)^2 + 2*b*d*r*log(c) + 2*a*d*r + (b*e*n*r^2*log(x)^2 +
2*(b*e*r^2*log(c) - b*e*n*r + a*e*r^2)*log(x))*x^r - 2*(b*e*n*x^r + b*d*n)*
dilog(-(e*x^r + d)/d + 1) - 2*(b*d*r*log(c) - b*d*n + a*d*r + (b*e*r*log(c)
 - b*e*n + a*e*r)*x^r)*log(e*x^r + d) + 2*(b*d*r^2*log(c) + a*d*r^2)*log(x)
 - 2*(b*e*n*r*x^r*log(x) + b*d*n*r*log(x))*log((e*x^r + d)/d))/(d^2*e*r^2*x
^r + d^3*r^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{(ex^r+d)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x), x)
```

maple [C] time = 0.06, size = 715, normalized size = 7.01

$$\frac{i\pi b\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ic\,x^n)^2}{2(e\,x^r+d)\,dr} - \frac{i\pi b\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)\ln(x^r)}{2d^2r} + \frac{i\pi b\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic\,x^n)\ln(e}{2d^2r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^r+d)^2,x)
```

```
[Out] -1/2*I*Pi/(e*x^r+d)*b/d/r*csgn(I*c*x^n)^3-1/2*I*Pi*b/d^2/r*csgn(I*c*x^n)^3*
ln(x^r)+1/2*I*Pi*b/d^2/r*csgn(I*c)*csgn(I*c*x^n)^2*ln(x^r)+1/2*I*Pi*b/d^2/r
*csgn(I*x^n)*csgn(I*c*x^n)^2*ln(x^r)+1/2*b/d^2*n*ln(x)^2+1/2*I*Pi/(e*x^r+d)
*b/d/r*csgn(I*x^n)*csgn(I*c*x^n)^2-1/(e*x^r+d)*b/d*n/r*ln(x)-b/d^2*n/r*ln(x
)*ln((e*x^r+d)/d)-1/2*I*Pi*b/d^2/r*csgn(I*x^n)*csgn(I*c*x^n)^2*ln(e*x^r+d)+
1/2*I*Pi*b/d^2/r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)*ln(e*x^r+d)+a/d^2/r*ln
(x^r)-a/d^2/r*ln(e*x^r+d)+1/(e*x^r+d)*a/d/r-1/2*I*Pi*b/d^2/r*csgn(I*c)*csgn
(I*c*x^n)^2*ln(e*x^r+d)-1/2*I*Pi/(e*x^r+d)*b/d/r*csgn(I*c)*csgn(I*x^n)*csgn
(I*c*x^n)-1/2*I*Pi*b/d^2/r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)*ln(x^r)-b/d^
2*n/r*ln(x)*ln(x^r)+b/d^2*n/r*ln(x)*ln(e*x^r+d)+1/2*I*Pi*b/d^2/r*csgn(I*c*x
^n)^3*ln(e*x^r+d)-1/(e*x^r+d)*b/d^2*e*n/r*x^r*ln(x)+1/2*I*Pi/(e*x^r+d)*b/d/
r*csgn(I*c)*csgn(I*c*x^n)^2-b/r^2*n/d^2*dilog((e*x^r+d)/d)+b/d^2/r*ln(c)*ln
(x^r)-b/d^2/r*ln(c)*ln(e*x^r+d)+1/(e*x^r+d)*b/d/r*ln(c)+b/d^2/r*ln(x^n)*ln(
x^r)-b/d^2/r*ln(x^n)*ln(e*x^r+d)+1/(e*x^r+d)*b/d/r*ln(x^n)+b/d^2*n/r^2*ln(e
*x^r+d)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{1}{derx^r + d^2 r} + \frac{\log(x)}{d^2} - \frac{\log\left(\frac{ex^r+d}{e}\right)}{d^2 r}\right) + b\int \frac{\log(c) + \log\left(x^n\right)}{e^2 x x^{2\,r} + 2\,dexx^r + d^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] a*(1/(d*e*r*x^r + d^2*r) + log(x)/d^2 - log((e*x^r + d)/e)/(d^2*r)) + b*int
egrate((log(c) + log(x^n))/(e^2*x*x^(2*r) + 2*d*e*x*x^r + d^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\ln\left(c\,x^n\right)}{x\,\left(d + e\,x^r\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^r)^2),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^r)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

3.426 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^3} dx$

Optimal. Leaf size=169

$$-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3r}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^3r\left(d+ex^r\right)}+\frac{a+b\log\left(cx^n\right)}{2dr\left(d+ex^r\right)^2}+\frac{bn\text{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{d^3r^2}+\frac{3bn\log\left(d+ex^r\right)}{2d^3r^2}-\frac{bn\,\text{lo}}{2d}$$

```
[Out] -1/2*b*n/d^2/r^2/(d+e*x^r)-1/2*b*n*ln(x)/d^3/r+1/2*(a+b*ln(c*x^n))/d/r/(d+e
*x^r)^2-e*x^r*(a+b*ln(c*x^n))/d^3/r/(d+e*x^r)-(a+b*ln(c*x^n))*ln(1+d/e/(x^r
))/d^3/r+3/2*b*n*ln(d+e*x^r)/d^3/r^2+b*n*polylog(2,-d/e/(x^r))/d^3/r^2
```

Rubi [A] time = 0.41, antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2349, 2345, 2391, 2335, 260, 2338, 266, 44}

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^3r^2}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^3r\left(d+ex^r\right)}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3r}+\frac{a+b\log\left(cx^n\right)}{2dr\left(d+ex^r\right)^2}-\frac{bn}{2d^2r^2\left(d+ex^r\right)}+\frac{3}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^3),x]
```

```
[Out] -(b*n)/(2*d^2*r^2*(d + e*x^r)) - (b*n*Log[x])/(2*d^3*r) + (a + b*Log[c*x^n]
)/(2*d*r*(d + e*x^r)^2) - (e*x^r*(a + b*Log[c*x^n]))/(d^3*r*(d + e*x^r)) -
((a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d^3*r) + (3*b*n*Log[d + e*x^r])/(2
*d^3*r^2) + (b*n*PolyLog[2, -(d/(e*x^r))])/(d^3*r^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
```

```
e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^3}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex^r)^2}\,dx}{d} - \frac{e\int \frac{x^{-1+r}\left(a+b\log(cx^n)\right)}{(d+ex^r)^3}\,dx}{d}$$

$$= \frac{a+b\log(cx^n)}{2dr(d+ex^r)^2} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx}{d^2} - \frac{e\int \frac{x^{-1+r}\left(a+b\log(cx^n)\right)}{(d+ex^r)^2}\,dx}{d^2} - \frac{(bn)\int \frac{1}{x(d+ex^r)^2}\,dx}{2dr}$$

$$= \frac{a+b\log(cx^n)}{2dr(d+ex^r)^2} - \frac{ex^r\left(a+b\log(cx^n)\right)}{d^3r(d+ex^r)} - \frac{\left(a+b\log(cx^n)\right)\log\left(1+\frac{dx^{-r}}{e}\right)}{d^3r} - \frac{(bn)\,\text{Subst}\,(}{}$$

$$= \frac{a+b\log(cx^n)}{2dr(d+ex^r)^2} - \frac{ex^r\left(a+b\log(cx^n)\right)}{d^3r(d+ex^r)} - \frac{\left(a+b\log(cx^n)\right)\log\left(1+\frac{dx^{-r}}{e}\right)}{d^3r} + \frac{bn\log(d+}{d^3r^2}$$

$$= -\frac{bn}{2d^2r^2(d+ex^r)} - \frac{bn\log(x)}{2d^3r} + \frac{a+b\log(cx^n)}{2dr(d+ex^r)^2} - \frac{ex^r\left(a+b\log(cx^n)\right)}{d^3r(d+ex^r)} - \frac{\left(a+b\log(cx\right.}{}$$

Mathematica [A] time = 0.24, size = 170, normalized size = 1.01

$$\frac{\frac{d^2r\left(a+b\log(cx^n)\right)}{(d+ex^r)^2} + \frac{d\left(2ar+2br\log(cx^n)-bn\right)}{d+ex^r} - 2ar\log(d-dx^r) + 2br\left(n\log(x)-\log(cx^n)\right)\log(d-dx^r) + 2bn\left(\text{Li}_2\left(\frac{e}{}\right.\right.}{2d^3r^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^3),x]
```

```
[Out] ((d^2*r*(a + b*Log[c*x^n]))/(d + e*x^r)^2 + (d*(-(b*n) + 2*a*r + 2*b*r*Log[
c*x^n]))/(d + e*x^r) + 3*b*n*Log[d - d*x^r] - 2*a*r*Log[d - d*x^r] + 2*b*r*
(n*Log[x] - Log[c*x^n])*Log[d - d*x^r] + 2*b*n*((r^2*Log[x]^2)/2 + (-(r*Log
[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/d]))/(2*d
^3*r^2)
```

fricas [B] time = 0.75, size = 401, normalized size = 2.37

$$\frac{bd^2nr^2\log(x)^2 + 3\,bd^2r\log(c) - bd^2n + 3\,ad^2r + \left(be^2nr^2\log(x)^2 + \left(2\,be^2r^2\log(c) - 3\,be^2nr + 2\,ae^2r^2\right)\log(x)\right)x^{2r}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(b*d^2*n*r^2*log(x)^2 + 3*b*d^2*r*log(c) - b*d^2*n + 3*a*d^2*r + (b*e^2
*n*r^2*log(x)^2 + (2*b*e^2*r^2*log(c) - 3*b*e^2*n*r + 2*a*e^2*r^2)*log(x))*
x^(2*r) + (2*b*d*e*n*r^2*log(x)^2 + 2*b*d*e*r*log(c) - b*d*e*n + 2*a*d*e*r
+ 4*(b*d*e*r^2*log(c) - b*d*e*n*r + a*d*e*r^2)*log(x))*x^r - 2*(b*e^2*n*x^(
2*r) + 2*b*d*e*n*x^r + b*d^2*n)*dilog(-(e*x^r + d)/d + 1) - (2*b*d^2*r*log(
c) - 3*b*d^2*n + 2*a*d^2*r + (2*b*e^2*r*log(c) - 3*b*e^2*n + 2*a*e^2*r)*x^(
2*r) + 2*(2*b*d*e*r*log(c) - 3*b*d*e*n + 2*a*d*e*r)*x^r)*log(e*x^r + d) + 2
*(b*d^2*r^2*log(c) + a*d^2*r^2)*log(x) - 2*(b*e^2*n*r*x^(2*r)*log(x) + 2*b*
d*e*n*r*x^r*log(x) + b*d^2*n*r*log(x))*log((e*x^r + d)/d))/(d^3*e^2*r^2*x^(
2*r) + 2*d^4*e*r^2*x^r + d^5*r^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^n\right) + a}{\left(ex^r + d\right)^3 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^3*x), x)
```

maple [C] time = 0.30, size = 1012, normalized size = 5.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^r+d)^3,x)
```

```
[Out] 1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*ln(e*x^r+d)-1/2*I/r*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*ln(x^r)-b/r*n/d^3*ln(x)*ln((e*x^
r+d)/d)+1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/(e*x^r+d)-1/2*I/r*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)^2/d^3*ln(e*x^r+d)-b/r*n*e/d^3*ln(x)*x^r/(e*x^r+d)-
b/r*n*e/d^2*ln(x)*x^r/(e*x^r+d)^2-b/r/d^2/(e*x^r+d)*n*ln(x)-1/2*b/r/d/(e*x^
r+d)^2*n*ln(x)-b/r/d^3*ln(x^r)*n*ln(x)+b/r/d^3*ln(e*x^r+d)*n*ln(x)+1/r*a/d^
2/(e*x^r+d)+1/2/r*a/d/(e*x^r+d)^2+1/4*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/
(e*x^r+d)^2-1/2*b/r*n*e^2/d^3*ln(x)*(x^r)^2/(e*x^r+d)^2+1/r*a/d^3*ln(x^r)-1
/r*a/d^3*ln(e*x^r+d)+1/4*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/(e*x^r+d)^2
+1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*ln(x^r)-1/2*I/r*b*Pi*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/(e*x^r+d)-1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn
(I*c)/d^3*ln(e*x^r+d)+1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*ln(x^r)+1/
2*b/d^3*n*ln(x)^2+1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2/(e*x^r+d)-1/
4*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/(e*x^r+d)^2+b/r/d^3*ln(x^r
)*ln(x^n)-b/r^2*n/d^3*dilog((e*x^r+d)/d)+1/2*b/r/d/(e*x^r+d)^2*ln(x^n)-b/r/
d^3*ln(e*x^r+d)*ln(x^n)+b/r/d^2/(e*x^r+d)*ln(x^n)-1/r*b*ln(c)/d^3*ln(e*x^r+
d)+1/r*b*ln(c)/d^2/(e*x^r+d)+1/2/r*b*ln(c)/d/(e*x^r+d)^2+1/r*b*ln(c)/d^3*ln
(x^r)-1/2*I/r*b*Pi*csgn(I*c*x^n)^3/d^2/(e*x^r+d)-1/2*I/r*b*Pi*csgn(I*c*x^n)
^3/d^3*ln(x^r)-1/4*I/r*b*Pi*csgn(I*c*x^n)^3/d/(e*x^r+d)^2+1/2*I/r*b*Pi*csgn
(I*c*x^n)^3/d^3*ln(e*x^r+d)-1/2*b*n/d^2/r^2/(e*x^r+d)+3/2*b*n*ln(e*x^r+d)/d
^3/r^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{2\,ex^{r}+3\,d}{d^{2}e^{2}rx^{2\,r}+2\,d^{3}erx^{r}+d^{4}r}+\frac{2\,\log(x)}{d^{3}}-\frac{2\,\log\left(\frac{ex^{r}+d}{e}\right)}{d^{3}r}\right)+b\int\frac{\log(c)+\log\left(x^{n}\right)}{e^{3}xx^{3\,r}+3\,de^{2}xx^{2\,r}+3\,d^{2}exx^{r}+d^{3}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^3,x, algorithm="maxima")
```

```
[Out] 1/2*a*((2*e*x^r + 3*d)/(d^2*e^2*r*x^(2*r) + 2*d^3*e*r*x^r + d^4*r) + 2*log(
x)/d^3 - 2*log((e*x^r + d)/e)/(d^3*r)) + b*integrate((log(c) + log(x^n))/(e
^3*x*x^(3*r) + 3*d*e^2*x*x^(2*r) + 3*d^2*e*x*x^r + d^3*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\ln\left(c\,x^{n}\right)}{x\,{\left(d+e\,x^{r}\right)}^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^r)^3),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^r)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r)**3,x)
```

```
[Out] Timed out
```

3.427 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))^2}{x}\,dx$

Optimal. Leaf size=245

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-\frac{6bd^2enx^r\left(a+b\log\left(cx^n\right)\right)}{r^2}+\frac{3d^2ex^r\left(a+b\log\left(cx^n\right)\right)^2}{r}-\frac{3bde^2nx^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r^2}+\frac{3de^2x^{2}}{}$$

```
[Out] 6*b^2*d^2*e*n^2*x^r/r^3+3/4*b^2*d*e^2*n^2*x^(2*r)/r^3+2/27*b^2*e^3*n^2*x^(3
*r)/r^3-6*b*d^2*e*n*x^r*(a+b*ln(c*x^n))/r^2-3/2*b*d*e^2*n*x^(2*r)*(a+b*ln(c
*x^n))/r^2-2/9*b*e^3*n*x^(3*r)*(a+b*ln(c*x^n))/r^2+3*d^2*e*x^r*(a+b*ln(c*x^
n))^2/r+3/2*d*e^2*x^(2*r)*(a+b*ln(c*x^n))^2/r+1/3*e^3*x^(3*r)*(a+b*ln(c*x^n
))^2/r+1/3*d^3*(a+b*ln(c*x^n))^3/b/n
```

Rubi [A] time = 0.30, antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2353, 2302, 30, 2305, 2304}

$$-\frac{6bd^2enx^r\left(a+b\log\left(cx^n\right)\right)}{r^2}+\frac{3d^2ex^r\left(a+b\log\left(cx^n\right)\right)^2}{r}+\frac{d^3\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-\frac{3bde^2nx^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r^2}+\frac{3de^2x}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (6*b^2*d^2*e*n^2*x^r)/r^3 + (3*b^2*d*e^2*n^2*x^(2*r))/(4*r^3) + (2*b^2*e^3*
n^2*x^(3*r))/(27*r^3) - (6*b*d^2*e*n*x^r*(a + b*Log[c*x^n]))/r^2 - (3*b*d*e
^2*n*x^(2*r)*(a + b*Log[c*x^n]))/(2*r^2) - (2*b*e^3*n*x^(3*r)*(a + b*Log[c*
x^n]))/(9*r^2) + (3*d^2*e*x^r*(a + b*Log[c*x^n])^2)/r + (3*d*e^2*x^(2*r)*(a
 + b*Log[c*x^n])^2)/(2*r) + (e^3*x^(3*r)*(a + b*Log[c*x^n])^2)/(3*r) + (d^3
*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
```

```
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int \frac{(d+ex^r)^3\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx = \int\left(\frac{d^3\left(a+b\log\left(cx^n\right)\right)^2}{x} + 3d^2ex^{-1+r}\left(a+b\log\left(cx^n\right)\right)^2 + 3de^2x^{-1+2r}\left(a+\right.\right.$$

$$= d^3\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}\,dx + \left(3d^2e\right)\int x^{-1+r}\left(a+b\log\left(cx^n\right)\right)^2\,dx + \left(3de\right.$$

$$= \frac{3d^2ex^r\left(a+b\log\left(cx^n\right)\right)^2}{r} + \frac{3de^2x^{2r}\left(a+b\log\left(cx^n\right)\right)^2}{2r} + \frac{e^3x^{3r}\left(a+b\log\right.}{3r}$$

$$= \frac{6b^2d^2en^2x^r}{r^3} + \frac{3b^2de^2n^2x^{2r}}{4r^3} + \frac{2b^2e^3n^2x^{3r}}{27r^3} - \frac{6bd^2enx^r\left(a+b\log\left(cx^n\right)\right)}{r^2} -$$

Mathematica [A] time = 0.45, size = 262, normalized size = 1.07

$$enx^r\left(18a^2r^2\left(18d^2+9dex^r+2e^2x^{2r}\right)-6abnr\left(108d^2+27dex^r+4e^2x^{2r}\right)+b^2n^2\left(648d^2+81dex^r+8e^2x^{2r}\right)\right)+$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (e*n*x^r*(18*a^2*r^2*(18*d^2 + 9*d*e*x^r + 2*e^2*x^(2*r)) - 6*a*b*n*r*(108*
d^2 + 27*d*e*x^r + 4*e^2*x^(2*r)) + b^2*n^2*(648*d^2 + 81*d*e*x^r + 8*e^2*x
^(2*r))) + 108*a^2*d^3*n*r^3*Log[x] - 6*b*e*n*r*x^r*(-6*a*r*(18*d^2 + 9*d*e
*x^r + 2*e^2*x^(2*r)) + b*n*(108*d^2 + 27*d*e*x^r + 4*e^2*x^(2*r)))*Log[c*x
^n] + 18*b*r^2*(6*a*d^3*r + b*e*n*x^r*(18*d^2 + 9*d*e*x^r + 2*e^2*x^(2*r)))
*Log[c*x^n]^2 + 36*b^2*d^3*r^3*Log[c*x^n]^3)/(108*n*r^3)
```

fricas [B] time = 0.79, size = 521, normalized size = 2.13

$$36\,b^2d^3n^2r^3\log(x)^3+108\left(b^2d^3nr^3\log(c)+abd^3nr^3\right)\log(x)^2+4\left(9\,b^2e^3n^2r^2\log(x)^2+9\,b^2e^3r^2\log(c)^2+2\,b^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))^2/x,x, algorithm="fricas")
```

```
[Out] 1/108*(36*b^2*d^3*n^2*r^3*log(x)^3 + 108*(b^2*d^3*n*r^3*log(c) + a*b*d^3*n*
r^3)*log(x)^2 + 4*(9*b^2*e^3*n^2*r^2*log(x)^2 + 9*b^2*e^3*r^2*log(c)^2 + 2*
b^2*e^3*n^2 - 6*a*b*e^3*n*r + 9*a^2*e^3*r^2 - 6*(b^2*e^3*n*r - 3*a*b*e^3*r^
2)*log(c) + 6*(3*b^2*e^3*n*r^2*log(c) - b^2*e^3*n^2*r + 3*a*b*e^3*n*r^2)*lo
g(x))*x^(3*r) + 81*(2*b^2*d*e^2*n^2*r^2*log(x)^2 + 2*b^2*d*e^2*r^2*log(c)^2
 + b^2*d*e^2*n^2 - 2*a*b*d*e^2*n*r + 2*a^2*d*e^2*r^2 - 2*(b^2*d*e^2*n*r - 2
*a*b*d*e^2*r^2)*log(c) + 2*(2*b^2*d*e^2*n*r^2*log(c) - b^2*d*e^2*n^2*r + 2*
a*b*d*e^2*n*r^2)*log(x))*x^(2*r) + 324*(b^2*d^2*e*n^2*r^2*log(x)^2 + b^2*d^
2*e*r^2*log(c)^2 + 2*b^2*d^2*e*n^2 - 2*a*b*d^2*e*n*r + a^2*d^2*e*r^2 - 2*(b
^2*d^2*e*n*r - a*b*d^2*e*r^2)*log(c) + 2*(b^2*d^2*e*n*r^2*log(c) - b^2*d^2*
e*n^2*r + a*b*d^2*e*n*r^2)*log(x))*x^r + 108*(b^2*d^3*r^3*log(c)^2 + 2*a*b*
d^3*r^3*log(c) + a^2*d^3*r^3)*log(x))/r^3
```

giac [B] time = 0.47, size = 634, normalized size = 2.59

$$\frac{1}{3}\,b^2d^3n^2\log(x)^3+\frac{3\,b^2d^2n^2x^re\log(x)^2}{r}+b^2d^3n\log(c)\log(x)^2+\frac{6\,b^2d^2nx^re\log(c)\log(x)}{r}+b^2d^3\log(c)^2\log(x)+a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))^2/x,x, algorithm="giac")
```

```
[Out] 1/3*b^2*d^3*n^2*log(x)^3 + 3*b^2*d^2*n^2*x^r*e*log(x)^2/r + b^2*d^3*n*log(c
)*log(x)^2 + 6*b^2*d^2*n*x^r*e*log(c)*log(x)/r + b^2*d^3*log(c)^2*log(x) +
a*b*d^3*n*log(x)^2 + 3/2*b^2*d*n^2*x^(2*r)*e^2*log(x)^2/r + 3*b^2*d^2*x^r*e
*log(c)^2/r - 6*b^2*d^2*n^2*x^r*e*log(x)/r^2 + 6*a*b*d^2*n*x^r*e*log(x)/r +
 2*a*b*d^3*log(c)*log(x) + 3*b^2*d*n*x^(2*r)*e^2*log(c)*log(x)/r + 1/3*b^2*
n^2*x^(3*r)*e^3*log(x)^2/r - 6*b^2*d^2*n*x^r*e*log(c)/r^2 + 6*a*b*d^2*x^r*e
*log(c)/r + 3/2*b^2*d*x^(2*r)*e^2*log(c)^2/r + a^2*d^3*log(x) - 3/2*b^2*d*n
^2*x^(2*r)*e^2*log(x)/r^2 + 3*a*b*d*n*x^(2*r)*e^2*log(x)/r + 2/3*b^2*n*x^(3
*r)*e^3*log(c)*log(x)/r + 6*b^2*d^2*n^2*x^r*e/r^3 - 6*a*b*d^2*n*x^r*e/r^2 +
 3*a^2*d^2*x^r*e/r - 3/2*b^2*d*n*x^(2*r)*e^2*log(c)/r^2 + 3*a*b*d*x^(2*r)*e
^2*log(c)/r + 1/3*b^2*x^(3*r)*e^3*log(c)^2/r - 2/9*b^2*n^2*x^(3*r)*e^3*log(
x)/r^2 + 2/3*a*b*n*x^(3*r)*e^3*log(x)/r + 3/4*b^2*d*n^2*x^(2*r)*e^2/r^3 - 3
/2*a*b*d*n*x^(2*r)*e^2/r^2 + 3/2*a^2*d*x^(2*r)*e^2/r - 2/9*b^2*n*x^(3*r)*e^
3*log(c)/r^2 + 2/3*a*b*x^(3*r)*e^3*log(c)/r + 2/27*b^2*n^2*x^(3*r)*e^3/r^3
- 2/9*a*b*n*x^(3*r)*e^3/r^2 + 1/3*a^2*x^(3*r)*e^3/r
```

maple [C] time = 0.62, size = 3984, normalized size = 16.26

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^r+d)^3*(b*ln(c*x^n)+a)^2/x,x)
```

```
[Out] ln(x)*a^2*d^3-3/2*I/r*ln(c)*Pi*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*(x^r)^2-3/2*I/r*Pi*a*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+
3/4*I/r^2*Pi*b^2*d*e^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-3*I/r*
ln(c)*Pi*b^2*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-3*I/r*Pi*a*b*d^2
*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+3*I/r^2*Pi*b^2*d^2*e*n*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*x^r+1/3/r*a^2*e^3*(x^r)^3+1/3*b^2*d^3*n^2*ln(x)^
3+ln(c)^2*ln(x)*b^2*d^3+2*ln(c)*ln(x)*a*b*d^3-ln(x)^2*ln(c)*b^2*d^3*n-ln(x)
^2*a*b*d^3*n+1/3/r*ln(c)^2*b^2*e^3*(x^r)^3+2/27/r^3*b^2*e^3*n^2*(x^r)^3+3/2
/r*a^2*d*e^2*(x^r)^2+3/r*a^2*d^2*e*x^r-1/4*csgn(I*c*x^n)^4*csgn(I*x^n)^2*d^
3*b^2*ln(x)*Pi^2+1/2*csgn(I*c*x^n)^5*csgn(I*x^n)*d^3*b^2*ln(x)*Pi^2+1/2*csg
n(I*c)*csgn(I*c*x^n)^5*d^3*b^2*ln(x)*Pi^2-1/4*csgn(I*c)^2*csgn(I*c*x^n)^4*d
^3*b^2*ln(x)*Pi^2-I*ln(c)*Pi*ln(x)*b^2*d^3*csgn(I*c*x^n)^3-I*Pi*ln(x)*a*b*d
^3*csgn(I*c*x^n)^3-1/18*b*(54*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*x^r-36*ln(x)*a*d^3*r^2-36*ln(c)*ln(x)*b*d^3*r^2+4*b*e^3*n*(x^r)^3-12*
a*e^3*r*(x^r)^3+6*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3+18*I*Pi*ln(x)*b*d^3*
csgn(I*c*x^n)^3*r^2-6*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-6*I*
Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-54*ln(c)*b*d*e^2*r*(x^r)^2-108
*ln(c)*b*d^2*e*r*x^r+108*b*d^2*e*n*x^r-54*a*d*e^2*r*(x^r)^2+6*I*Pi*b*e^3*r*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-27*I*Pi*b*d*e^2*r*csgn(I*c*x^n)
^2*csgn(I*c)*(x^r)^2+18*b*d^3*n*ln(x)^2*r^2+27*b*d*e^2*n*(x^r)^2-108*a*d^2*
e*r*x^r-12*ln(c)*b*e^3*r*(x^r)^3+27*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-
18*I*Pi*ln(x)*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2*r^2-18*I*Pi*ln(x)*b*d^3*csg
n(I*c*x^n)^2*csgn(I*c)*r^2+54*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r+27*I*Pi*b*
d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-54*I*Pi*b*d^2*e*r*csgn(
I*x^n)*csgn(I*c*x^n)^2*x^r-54*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r-
27*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+18*I*Pi*ln(x)*b*d^3*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*r^2)/r^2*ln(x^n)+1/6*b^2*(2*e^3*(x^r)^3+
6*d^3*r*ln(x)+9*d*e^2*(x^r)^2+18*d^2*e*x^r)/r*ln(x^n)^2-1/4*csgn(I*c*x^n)^6
*d^3*b^2*ln(x)*Pi^2+3/4/r*Pi^2*b^2*d*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn
(I*c)*(x^r)^2-3/8/r*Pi^2*b^2*d*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^
2*(x^r)^2-3/2/r*Pi^2*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*(x^r)^
2+3/4/r*Pi^2*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*(x^r)^2+3/2/
r*Pi^2*b^2*d^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x^r-3/4/r*Pi^2*b^2
```

```
*d^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x^r-3/r*Pi^2*b^2*d^2*e*csg
n(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*x^r+3/2/r*Pi^2*b^2*d^2*e*csgn(I*x^n)*csg
n(I*c*x^n)^3*csgn(I*c)^2*x^r-2/9/r^2*a*b*e^3*n*(x^r)^3+3/r*ln(c)^2*b^2*d^2*
e*x^r+3/4/r^3*b^2*d*e^2*n^2*(x^r)^2-1/12/r*Pi^2*b^2*e^3*csgn(I*c*x^n)^6*(x^
r)^3+2/3/r*ln(c)*a*b*e^3*(x^r)^3-2/9/r^2*ln(c)*b^2*e^3*n*(x^r)^3+3/2/r*ln(c
)^2*b^2*d*e^2*(x^r)^2+1/3*I/r*ln(c)*Pi*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*
(x^r)^3+1/3*I/r*ln(c)*Pi*b^2*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+1/3*I/r*
Pi*a*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-1/9*I/r^2*Pi*b^2*e^3*n*csgn(
I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+1/3*I/r*Pi*a*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)
*(x^r)^3-1/9*I/r^2*Pi*b^2*e^3*n*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-3/2*I/r*l
n(c)*Pi*b^2*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-3/2*I/r*Pi*a*b*d*e^2*csgn(I*c*x^n
)^3*(x^r)^2+3/4*I/r^2*Pi*b^2*d*e^2*n*csgn(I*c*x^n)^3*(x^r)^2-3*I/r*ln(c)*Pi
*b^2*d^2*e*csgn(I*c*x^n)^3*x^r-3*I/r*Pi*a*b*d^2*e*csgn(I*c*x^n)^3*x^r+3*I/r
^2*Pi*b^2*d^2*e*n*csgn(I*c*x^n)^3*x^r+1/2*I*ln(x)^2*Pi*b^2*d^3*n*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)-I*ln(c)*Pi*ln(x)*b^2*d^3*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)-I*Pi*ln(x)*a*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*ln(
x)*a*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*ln(x)*a*b*d^3*csgn(I*c*x^n)^2*c
sgn(I*c)+1/6/r*Pi^2*b^2*e^3*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*(x^r)^3
-1/12/r*Pi^2*b^2*e^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*(x^r)^3-1/3/
r*Pi^2*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*(x^r)^3+1/6/r*Pi^2*b^2
*e^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*(x^r)^3-3/8/r*Pi^2*b^2*d*e^2*c
sgn(I*x^n)^2*csgn(I*c*x^n)^4*(x^r)^2+3/4/r*Pi^2*b^2*d*e^2*csgn(I*x^n)*csgn(
I*c*x^n)^5*(x^r)^2+3/4/r*Pi^2*b^2*d*e^2*csgn(I*c*x^n)^5*csgn(I*c)*(x^r)^2-3
/8/r*Pi^2*b^2*d*e^2*csgn(I*c*x^n)^4*csgn(I*c)^2*(x^r)^2-3/4/r*Pi^2*b^2*d^2*
e*csgn(I*x^n)^2*csgn(I*c*x^n)^4*x^r+3/2/r*Pi^2*b^2*d^2*e*csgn(I*x^n)*csgn(I
*c*x^n)^5*x^r+3/2/r*Pi^2*b^2*d^2*e*csgn(I*c*x^n)^5*csgn(I*c)*x^r-3/4/r*Pi^2
*b^2*d^2*e*csgn(I*c*x^n)^4*csgn(I*c)^2*x^r-1/2*I*ln(x)^2*Pi*b^2*d^3*n*csgn(
I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(x)^2*Pi*b^2*d^3*n*csgn(I*c*x^n)^2*csgn(I*c)
-1/3*I/r*ln(c)*Pi*b^2*e^3*csgn(I*c*x^n)^3*(x^r)^3-1/3*I/r*Pi*a*b*e^3*csgn(I
*c*x^n)^3*(x^r)^3+1/9*I/r^2*Pi*b^2*e^3*n*csgn(I*c*x^n)^3*(x^r)^3+I*ln(c)*Pi
*ln(x)*b^2*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+I*ln(c)*Pi*ln(x)*b^2*d^3*csgn(I*
c*x^n)^2*csgn(I*c)+1/6/r*Pi^2*b^2*e^3*csgn(I*c*x^n)^5*csgn(I*c)*(x^r)^3-1/1
2/r*Pi^2*b^2*e^3*csgn(I*c*x^n)^4*csgn(I*c)^2*(x^r)^3-3/8/r*Pi^2*b^2*d*e^2*c
sgn(I*c*x^n)^6*(x^r)^2-3/4/r*Pi^2*b^2*d^2*e*csgn(I*c*x^n)^6*x^r+3/r*ln(c)*a
*b*d*e^2*(x^r)^2-3/2/r^2*ln(c)*b^2*d*e^2*n*(x^r)^2-3/2/r^2*a*b*d*e^2*n*(x^r
)^2+6/r*ln(c)*a*b*d^2*e*x^r-6/r^2*ln(c)*b^2*d^2*e*n*x^r-6/r^2*a*b*d^2*e*n*x
^r-1/12/r*Pi^2*b^2*e^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4*(x^r)^3+1/6/r*Pi^2*b^2
*e^3*csgn(I*x^n)*csgn(I*c*x^n)^5*(x^r)^3+1/2*I*ln(x)^2*Pi*b^2*d^3*n*csgn(I*
c*x^n)^3+3/2*I/r*Pi*a*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-3/4*I/r^2*P
i*b^2*d*e^2*n*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+3*I/r*ln(c)*Pi*b^2*d^2*e*cs
gn(I*x^n)*csgn(I*c*x^n)^2*x^r+3*I/r*ln(c)*Pi*b^2*d^2*e*csgn(I*c*x^n)^2*csgn
(I*c)*x^r+3*I/r*Pi*a*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-3*I/r^2*Pi*b^2
*d^2*e*n*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+3*I/r*Pi*a*b*d^2*e*csgn(I*c*x^n)^2
*csgn(I*c)*x^r+6*b^2*d^2*e*n^2*x^r/r^3-3*I/r^2*Pi*b^2*d^2*e*n*csgn(I*c*x^n)
^2*csgn(I*c)*x^r-1/3*I/r*ln(c)*Pi*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*(x^r)^3-1/3*I/r*Pi*a*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+1
/9*I/r^2*Pi*b^2*e^3*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+3/2*I/r*l
n(c)*Pi*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+3/2*I/r*ln(c)*Pi*b^2*
d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+3/2*I/r*Pi*a*b*d*e^2*csgn(I*x^n)*cs
gn(I*c*x^n)^2*(x^r)^2-3/4*I/r^2*Pi*b^2*d*e^2*n*csgn(I*x^n)*csgn(I*c*x^n)^2*
(x^r)^2+1/2*csgn(I*c)*csgn(I*c*x^n)^3*csgn(I*x^n)^2*d^3*b^2*ln(x)*Pi^2-1/4*
csgn(I*c)^2*csgn(I*c*x^n)^2*csgn(I*x^n)^2*d^3*b^2*ln(x)*Pi^2-csgn(I*c)*csgn
(I*c*x^n)^4*csgn(I*x^n)*d^3*b^2*ln(x)*Pi^2+1/2*csgn(I*c)^2*csgn(I*c*x^n)^3*
csgn(I*x^n)*d^3*b^2*ln(x)*Pi^2
```

maxima [A] time = 1.36, size = 391, normalized size = 1.60

$$\frac{b^2e^3x^{3r}\log(cx^n)^2}{3r}+\frac{3b^2de^2x^{2r}\log(cx^n)^2}{2r}+\frac{3b^2d^2ex^r\log(cx^n)^2}{r}+\frac{b^2d^3\log(cx^n)^3}{3n}-\frac{2}{27}b^2e^3\left(\frac{3nx^{3r}\log(cx^n)}{r^2}-n\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))^2/x,x, algorithm="maxima")
```

```
[Out] 1/3*b^2*e^3*x^(3*r)*log(c*x^n)^2/r + 3/2*b^2*d*e^2*x^(2*r)*log(c*x^n)^2/r +
 3*b^2*d^2*e*x^r*log(c*x^n)^2/r + 1/3*b^2*d^3*log(c*x^n)^3/n - 2/27*b^2*e^3
*(3*n*x^(3*r)*log(c*x^n)/r^2 - n^2*x^(3*r)/r^3) - 3/4*b^2*d*e^2*(2*n*x^(2*r
)*log(c*x^n)/r^2 - n^2*x^(2*r)/r^3) - 6*b^2*d^2*e*(n*x^r*log(c*x^n)/r^2 - n
^2*x^r/r^3) + 2/3*a*b*e^3*x^(3*r)*log(c*x^n)/r + 3*a*b*d*e^2*x^(2*r)*log(c*
x^n)/r + 6*a*b*d^2*e*x^r*log(c*x^n)/r + a*b*d^3*log(c*x^n)^2/n + a^2*d^3*lo
g(x) - 2/9*a*b*e^3*n*x^(3*r)/r^2 + 1/3*a^2*e^3*x^(3*r)/r - 3/2*a*b*d*e^2*n*
x^(2*r)/r^2 + 3/2*a^2*d*e^2*x^(2*r)/r - 6*a*b*d^2*e*n*x^r/r^2 + 3*a^2*d^2*e
*x^r/r
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(d+e\,x^r)^3\,(a+b\,\ln(c\,x^n))^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^3*(a + b*log(c*x^n))^2)/x,x)
```

```
[Out] int(((d + e*x^r)^3*(a + b*log(c*x^n))^2)/x, x)
```

sympy [A] time = 50.70, size = 816, normalized size = 3.33

$$\begin{cases} a^2d^3\log(x) + \frac{3a^2d^2ex^r}{r} + \frac{3a^2de^2x^{2r}}{2r} + \frac{a^2e^3x^{3r}}{3r} + abd^3n\log(x)^2 + 2abd^3\log(c)\log(x) + \frac{6abd^2enx^r\log(x)}{r} - \frac{6abd^2enx^r}{r^2} + \cdots \\ (d+e)^3\left(\begin{cases} \frac{a^2\log(cx^n)+ab\log(cx^n)^2+\frac{b^2\log(cx^n)^3}{3}}{n} & \text{for } n\neq 0 \\ \left(a^2+2ab\log(c)+b^2\log(c)^2\right)\log(x) & \text{otherwise} \end{cases}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))**2/x,x)
```

```
[Out] Piecewise((a**2*d**3*log(x) + 3*a**2*d**2*e*x**r/r + 3*a**2*d*e**2*x**(2*r)
/(2*r) + a**2*e**3*x**(3*r)/(3*r) + a*b*d**3*n*log(x)**2 + 2*a*b*d**3*log(c
)*log(x) + 6*a*b*d**2*e*n*x**r*log(x)/r - 6*a*b*d**2*e*n*x**r/r**2 + 6*a*b*
d**2*e*x**r*log(c)/r + 3*a*b*d*e**2*n*x**(2*r)*log(x)/r - 3*a*b*d*e**2*n*x*
*(2*r)/(2*r**2) + 3*a*b*d*e**2*x**(2*r)*log(c)/r + 2*a*b*e**3*n*x**(3*r)*lo
g(x)/(3*r) - 2*a*b*e**3*n*x**(3*r)/(9*r**2) + 2*a*b*e**3*x**(3*r)*log(c)/(3
*r) + b**2*d**3*n**2*log(x)**3/3 + b**2*d**3*n*log(c)*log(x)**2 + b**2*d**3
*log(c)**2*log(x) + 3*b**2*d**2*e*n**2*x**r*log(x)**2/r - 6*b**2*d**2*e*n**
2*x**r*log(x)/r**2 + 6*b**2*d**2*e*n**2*x**r/r**3 + 6*b**2*d**2*e*n*x**r*lo
g(c)*log(x)/r - 6*b**2*d**2*e*n*x**r*log(c)/r**2 + 3*b**2*d**2*e*x**r*log(c
)**2/r + 3*b**2*d*e**2*n**2*x**(2*r)*log(x)**2/(2*r) - 3*b**2*d*e**2*n**2*x
**(2*r)*log(x)/(2*r**2) + 3*b**2*d*e**2*n**2*x**(2*r)/(4*r**3) + 3*b**2*d*e
**2*n*x**(2*r)*log(c)*log(x)/r - 3*b**2*d*e**2*n*x**(2*r)*log(c)/(2*r**2) +
 3*b**2*d*e**2*x**(2*r)*log(c)**2/(2*r) + b**2*e**3*n**2*x**(3*r)*log(x)**2
/(3*r) - 2*b**2*e**3*n**2*x**(3*r)*log(x)/(9*r**2) + 2*b**2*e**3*n**2*x**(3
*r)/(27*r**3) + 2*b**2*e**3*n*x**(3*r)*log(c)*log(x)/(3*r) - 2*b**2*e**3*n*
x**(3*r)*log(c)/(9*r**2) + b**2*e**3*x**(3*r)*log(c)**2/(3*r), Ne(r, 0)), (
(d + e)**3*Piecewise(((a**2*log(c*x**n) + a*b*log(c*x**n)**2 + b**2*log(c*x
**n)**3/3)/n, Ne(n, 0)), ((a**2 + 2*a*b*log(c) + b**2*log(c)**2)*log(x), Tr
ue)), True))
```

3.428 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))^2}{x}\,dx$

Optimal. Leaf size=161

$$\frac{d^2\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-\frac{4bdenx^r\left(a+b\log\left(cx^n\right)\right)}{r^2}+\frac{2dex^r\left(a+b\log\left(cx^n\right)\right)^2}{r}-\frac{be^2nx^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r^2}+\frac{e^2x^{2r}\left(a\right.}{}$$

```
[Out] 4*b^2*d*e*n^2*x^r/r^3+1/4*b^2*e^2*n^2*x^(2*r)/r^3-4*b*d*e*n*x^r*(a+b*ln(c*x
^n))/r^2-1/2*b*e^2*n*x^(2*r)*(a+b*ln(c*x^n))/r^2+2*d*e*x^r*(a+b*ln(c*x^n))^
2/r+1/2*e^2*x^(2*r)*(a+b*ln(c*x^n))^2/r+1/3*d^2*(a+b*ln(c*x^n))^3/b/n
```

Rubi [A] time = 0.24, antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2353, 2302, 30, 2305, 2304}

$$\frac{d^2\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-\frac{4bdenx^r\left(a+b\log\left(cx^n\right)\right)}{r^2}+\frac{2dex^r\left(a+b\log\left(cx^n\right)\right)^2}{r}-\frac{be^2nx^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r^2}+\frac{e^2x^{2r}\left(a\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (4*b^2*d*e*n^2*x^r)/r^3 + (b^2*e^2*n^2*x^(2*r))/(4*r^3) - (4*b*d*e*n*x^r*(a
 + b*Log[c*x^n]))/r^2 - (b*e^2*n*x^(2*r)*(a + b*Log[c*x^n]))/(2*r^2) + (2*d
*e*x^r*(a + b*Log[c*x^n])^2)/r + (e^2*x^(2*r)*(a + b*Log[c*x^n])^2)/(2*r) +
 (d^2*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int \frac{(d+ex^r)^2\left(a+b\log(cx^n)\right)^2}{x}\,dx = \int\left(\frac{d^2\left(a+b\log(cx^n)\right)^2}{x} + 2dex^{-1+r}\left(a+b\log(cx^n)\right)^2 + e^2x^{-1+2r}\left(a+b\log\right.\right.$$

$$= d^2\int\frac{\left(a+b\log(cx^n)\right)^2}{x}\,dx + (2de)\int x^{-1+r}\left(a+b\log(cx^n)\right)^2\,dx + e^2\int x^{-1}$$

$$= \frac{2dex^r\left(a+b\log(cx^n)\right)^2}{r} + \frac{e^2x^{2r}\left(a+b\log(cx^n)\right)^2}{2r} + \frac{d^2\,\text{Subst}\left(\int x^2\,dx, x, a\right.}{bn}$$

$$= \frac{4b^2den^2x^r}{r^3} + \frac{b^2e^2n^2x^{2r}}{4r^3} - \frac{4bdenx^r\left(a+b\log(cx^n)\right)}{r^2} - \frac{be^2nx^{2r}\left(a+b\log(cx\right.}{2r^2}$$

Mathematica [A] time = 0.27, size = 179, normalized size = 1.11

$$\frac{3enx^r\left(2a^2r^2(4d+ex^r)-2abnr(8d+ex^r)+b^2n^2(16d+ex^r)\right)+12a^2d^2nr^3\log(x)+6br^2\log^2(cx^n)\left(2ad^2r+ben\right.}{12nr^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (3*e*n*x^r*(2*a^2*r^2*(4*d + e*x^r) - 2*a*b*n*r*(8*d + e*x^r) + b^2*n^2*(16
*d + e*x^r)) + 12*a^2*d^2*n*r^3*Log[x] - 6*b*e*n*r*x^r*(-2*a*r*(4*d + e*x^r
) + b*n*(8*d + e*x^r))*Log[c*x^n] + 6*b*r^2*(2*a*d^2*r + b*e*n*x^r*(4*d + e
*x^r))*Log[c*x^n]^2 + 4*b^2*d^2*r^3*Log[c*x^n]^3)/(12*n*r^3)
```

fricas [B] time = 0.69, size = 353, normalized size = 2.19

$$4\,b^2d^2n^2r^3\log(x)^3 + 12\left(b^2d^2nr^3\log(c) + abd^2nr^3\right)\log(x)^2 + 3\left(2\,b^2e^2n^2r^2\log(x)^2 + 2\,b^2e^2r^2\log(c)^2 + b^2e^2n^2 - \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))^2/x,x, algorithm="fricas")
```

```
[Out] 1/12*(4*b^2*d^2*n^2*r^3*log(x)^3 + 12*(b^2*d^2*n*r^3*log(c) + a*b*d^2*n*r^3
)*log(x)^2 + 3*(2*b^2*e^2*n^2*r^2*log(x)^2 + 2*b^2*e^2*r^2*log(c)^2 + b^2*e
^2*n^2 - 2*a*b*e^2*n*r + 2*a^2*e^2*r^2 - 2*(b^2*e^2*n*r - 2*a*b*e^2*r^2)*lo
g(c) + 2*(2*b^2*e^2*n*r^2*log(c) - b^2*e^2*n^2*r + 2*a*b*e^2*n*r^2)*log(x))
*x^(2*r) + 24*(b^2*d*e*n^2*r^2*log(x)^2 + b^2*d*e*r^2*log(c)^2 + 2*b^2*d*e*
n^2 - 2*a*b*d*e*n*r + a^2*d*e*r^2 - 2*(b^2*d*e*n*r - a*b*d*e*r^2)*log(c) +
2*(b^2*d*e*n*r^2*log(c) - b^2*d*e*n^2*r + a*b*d*e*n*r^2)*log(x))*x^r + 12*(
b^2*d^2*r^3*log(c)^2 + 2*a*b*d^2*r^3*log(c) + a^2*d^2*r^3)*log(x))/r^3
```

giac [B] time = 0.32, size = 421, normalized size = 2.61

$$\frac{1}{3}\,b^2d^2n^2\log(x)^3 + \frac{2\,b^2dn^2x^re\log(x)^2}{r} + b^2d^2n\log(c)\log(x)^2 + \frac{4\,b^2dnx^re\log(c)\log(x)}{r} + b^2d^2\log(c)^2\log(x) + abd^2n$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))^2/x,x, algorithm="giac")
```

```
[Out] 1/3*b^2*d^2*n^2*log(x)^3 + 2*b^2*d*n^2*x^r*e*log(x)^2/r + b^2*d^2*n*log(c)*
log(x)^2 + 4*b^2*d*n*x^r*e*log(c)*log(x)/r + b^2*d^2*log(c)^2*log(x) + a*b*
d^2*n*log(x)^2 + 1/2*b^2*n^2*x^(2*r)*e^2*log(x)^2/r + 2*b^2*d*x^r*e*log(c)^
2/r - 4*b^2*d*n^2*x^r*e*log(x)/r^2 + 4*a*b*d*n*x^r*e*log(x)/r + 2*a*b*d^2*l
```

```
og(c)*log(x) + b^2*n*x^(2*r)*e^2*log(c)*log(x)/r - 4*b^2*d*n*x^r*e*log(c)/r
^2 + 4*a*b*d*x^r*e*log(c)/r + 1/2*b^2*x^(2*r)*e^2*log(c)^2/r + a^2*d^2*log(
x) - 1/2*b^2*n^2*x^(2*r)*e^2*log(x)/r^2 + a*b*n*x^(2*r)*e^2*log(x)/r + 4*b^
2*d*n^2*x^r*e/r^3 - 4*a*b*d*n*x^r*e/r^2 + 2*a^2*d*x^r*e/r - 1/2*b^2*n*x^(2*
r)*e^2*log(c)/r^2 + a*b*x^(2*r)*e^2*log(c)/r + 1/4*b^2*n^2*x^(2*r)*e^2/r^3
- 1/2*a*b*n*x^(2*r)*e^2/r^2 + 1/2*a^2*x^(2*r)*e^2/r
```

maple [C] time = 0.53, size = 2844, normalized size = 17.66

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^r+d)^2*(b*ln(c*x^n)+a)^2/x,x)
```

```
[Out] b^2*d^2*ln(c)^2*ln(x)+1/3*b^2*d^2*n^2*ln(x)^3+a^2*d^2*ln(x)+1/2/r*a^2*e^2*(
x^r)^2-1/2*I*ln(x)^2*Pi*b^2*d^2*n*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*ln(x)^2*P
i*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I/r*ln(c)*Pi*b^2*e^2*csgn(I*c*x
^n)^3*(x^r)^2-1/2*I/r*Pi*a*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+1/4*I/r^2*Pi*b^2*e
^2*n*csgn(I*c*x^n)^3*(x^r)^2-1/2*b*(-4*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*
c)*x^r+4*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r-I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn
(I*c)*(x^r)^2+2*I*Pi*ln(x)*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*r^2+I*
Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+I*Pi*b*e^2*r*csgn(I*
c*x^n)^3*(x^r)^2-2*I*Pi*ln(x)*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*r^2+4*I*Pi*
b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-I*Pi*b*e^2*r*csgn(I*x^n)*cs
gn(I*c*x^n)^2*(x^r)^2-4*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-2*I*Pi
*ln(x)*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)*r^2+2*I*Pi*ln(x)*b*d^2*csgn(I*c*x^n)
^3*r^2+2*b*d^2*n*ln(x)^2*r^2-4*ln(c)*ln(x)*b*d^2*r^2-2*ln(c)*b*e^2*r*(x^r)^
2-8*b*d*e*r*x^r*ln(c)-4*ln(x)*a*d^2*r^2-2*a*e^2*r*(x^r)^2+b*e^2*n*(x^r)^2-8
*a*d*e*r*x^r+8*b*d*e*n*x^r)/r^2*ln(x^n)+1/2*b^2*(2*d^2*r*ln(x)+(x^r)^2*e^2+
4*d*e*x^r)/r*ln(x^n)^2+2*a*b*d^2*ln(c)*ln(x)-a*b*d^2*n*ln(x)^2-b^2*d^2*n*ln
(c)*ln(x)^2+I*ln(c)*Pi*ln(x)*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)+I*ln(c)*Pi*l
n(x)*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*ln(x)*a*b*d^2*csgn(I*c*x^n)^2
*csgn(I*c)+I*Pi*ln(x)*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2/r*Pi^2*b^2*e^
2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*(x^r)^2+1/4/r*Pi^2*b^2*e^2*csgn(I*x
^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*(x^r)^2+1/4/r*Pi^2*b^2*e^2*csgn(I*x^n)^2*cs
gn(I*c*x^n)^3*csgn(I*c)*(x^r)^2-1/8/r*Pi^2*b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x
^n)^2*csgn(I*c)^2*(x^r)^2+1/r*Pi^2*b^2*d*e*csgn(I*c*x^n)^5*csgn(I*c)*x^r+1/
r*Pi^2*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^5*x^r-1/2/r*Pi^2*b^2*d*e*csgn(I*c*
x^n)^4*csgn(I*c)^2*x^r-1/2/r*Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^4*x^r
-2*I/r*ln(c)*Pi*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-2*I/r*Pi*a*
b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2*I/r^2*Pi*b^2*d*e*n*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-1/2/r^2*a*b*e^2*n*(x^r)^2-1/8/r*Pi^2*b^2*e^
2*csgn(I*c*x^n)^6*(x^r)^2+1/r*ln(c)*a*b*e^2*(x^r)^2-1/2/r^2*ln(c)*b^2*e^2*n
*(x^r)^2+2/r*ln(c)^2*b^2*d*e*x^r-1/4*csgn(I*c*x^n)^4*csgn(I*x^n)^2*d^2*b^2*
ln(x)*Pi^2+1/2*csgn(I*c*x^n)^5*csgn(I*x^n)*d^2*b^2*ln(x)*Pi^2+1/2*csgn(I*c)
*csgn(I*c*x^n)^5*d^2*b^2*ln(x)*Pi^2-1/4*csgn(I*c)^2*csgn(I*c*x^n)^4*d^2*b^2
*ln(x)*Pi^2-1/4*csgn(I*c)^2*csgn(I*c*x^n)^2*csgn(I*x^n)^2*d^2*b^2*ln(x)*Pi^
2-csgn(I*c)*csgn(I*c*x^n)^4*csgn(I*x^n)*d^2*b^2*ln(x)*Pi^2+1/2*csgn(I*c)^2*
csgn(I*c*x^n)^3*csgn(I*x^n)*d^2*b^2*ln(x)*Pi^2+4*b^2*d*e*n^2*x^r/r^3-1/4*cs
gn(I*c*x^n)^6*d^2*b^2*ln(x)*Pi^2+1/2/r*ln(c)^2*b^2*e^2*(x^r)^2+1/4/r^3*b^2*
e^2*n^2*(x^r)^2+2/r*a^2*d*e*x^r+1/2*csgn(I*c)*csgn(I*c*x^n)^3*csgn(I*x^n)^2
*d^2*b^2*ln(x)*Pi^2-1/2*I/r*ln(c)*Pi*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*(x^r)^2-1/2*I/r*Pi*a*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^
2+1/4*I/r^2*Pi*b^2*e^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+2*I/r*
ln(c)*Pi*b^2*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2*I/r*ln(c)*Pi*b^2*d*e*csgn(
I*x^n)*csgn(I*c*x^n)^2*x^r+2*I/r*Pi*a*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-2
*I/r^2*Pi*b^2*d*e*n*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2*I/r*Pi*a*b*d*e*csgn(I*x
^n)*csgn(I*c*x^n)^2*x^r-2*I/r^2*Pi*b^2*d*e*n*csgn(I*x^n)*csgn(I*c*x^n)^2*x^
r+1/4/r*Pi^2*b^2*e^2*csgn(I*c*x^n)^5*csgn(I*c)*(x^r)^2+1/4/r*Pi^2*b^2*e^2*c
sgn(I*x^n)*csgn(I*c*x^n)^5*(x^r)^2-1/8/r*Pi^2*b^2*e^2*csgn(I*c*x^n)^4*csgn(
```

```
I*c)^2*(x^r)^2-1/8/r*Pi^2*b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4*(x^r)^2-1/2
/r*Pi^2*b^2*d*e*csgn(I*c*x^n)^6*x^r+4/r*ln(c)*a*b*d*e*x^r-4/r^2*ln(c)*b^2*d
*e*n*x^r-4/r^2*a*b*d*e*n*x^r-I*Pi*ln(x)*a*b*d^2*csgn(I*c*x^n)^3+1/2*I*ln(x)
^2*Pi*b^2*d^2*n*csgn(I*c*x^n)^3-I*ln(c)*Pi*ln(x)*b^2*d^2*csgn(I*c*x^n)^3-I*
ln(c)*Pi*ln(x)*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*ln(x)*a*b*d
^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2/r*Pi^2*b^2*d*e*csgn(I*x^n)*csgn(I*
c*x^n)^4*csgn(I*c)*x^r+1/r*Pi^2*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*
c)^2*x^r+1/r*Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x^r-1/2/r
*Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x^r+1/2*I/r*ln(c)*P
i*b^2*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+1/2*I/r*ln(c)*Pi*b^2*e^2*csgn(I
*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1/2*I/r*Pi*a*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*
(x^r)^2-1/4*I/r^2*Pi*b^2*e^2*n*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+1/2*I/r*Pi
*a*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-1/4*I/r^2*Pi*b^2*e^2*n*csgn(I*
x^n)*csgn(I*c*x^n)^2*(x^r)^2-2*I/r*ln(c)*Pi*b^2*d*e*csgn(I*c*x^n)^3*x^r-2*I
/r*Pi*a*b*d*e*csgn(I*c*x^n)^3*x^r+2*I/r^2*Pi*b^2*d*e*n*csgn(I*c*x^n)^3*x^r+
1/2*I*ln(x)^2*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
```

maxima [A] time = 1.37, size = 259, normalized size = 1.61

$$\frac{b^2e^2x^{2r}\log(cx^n)^2}{2r}+\frac{2b^2dex^r\log(cx^n)^2}{r}+\frac{b^2d^2\log(cx^n)^3}{3n}-\frac{1}{4}b^2e^2\left(\frac{2nx^{2r}\log(cx^n)}{r^2}-\frac{n^2x^{2r}}{r^3}\right)-4b^2de\left(\frac{nx^r\log(cx^n)}{r^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))^2/x,x, algorithm="maxima")
```

```
[Out] 1/2*b^2*e^2*x^(2*r)*log(c*x^n)^2/r + 2*b^2*d*e*x^r*log(c*x^n)^2/r + 1/3*b^2
*d^2*log(c*x^n)^3/n - 1/4*b^2*e^2*(2*n*x^(2*r)*log(c*x^n)/r^2 - n^2*x^(2*r)
/r^3) - 4*b^2*d*e*(n*x^r*log(c*x^n)/r^2 - n^2*x^r/r^3) + a*b*e^2*x^(2*r)*lo
g(c*x^n)/r + 4*a*b*d*e*x^r*log(c*x^n)/r + a*b*d^2*log(c*x^n)^2/n + a^2*d^2*
log(x) - 1/2*a*b*e^2*n*x^(2*r)/r^2 + 1/2*a^2*e^2*x^(2*r)/r - 4*a*b*d*e*n*x^
r/r^2 + 2*a^2*d*e*x^r/r
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^r)^2\,(a+b\,\ln(c\,x^n))^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^2*(a + b*log(c*x^n))^2)/x,x)
```

```
[Out] int(((d + e*x^r)^2*(a + b*log(c*x^n))^2)/x, x)
```

sympy [A] time = 33.78, size = 546, normalized size = 3.39

$$\begin{cases} a^2d^2\log(x)+\frac{2a^2dex^r}{r}+\frac{a^2e^2x^{2r}}{2r}+abd^2n\log(x)^2+2abd^2\log(c)\log(x)+\frac{4abdenx^r\log(x)}{r}-\frac{4abdenx^r}{r^2}+\frac{4abdex^r\log(c)}{r}+ \\ (d+e)^2\left(\begin{cases}\frac{a^2\log(cx^n)+ab\log(cx^n)^2+\frac{b^2\log(cx^n)^3}{3}}{n} & \text{for } n\neq 0\\ \left(a^2+2ab\log(c)+b^2\log(c)^2\right)\log(x) & \text{otherwise}\end{cases}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))**2/x,x)
```

```
[Out] Piecewise((a**2*d**2*log(x) + 2*a**2*d*e*x**r/r + a**2*e**2*x**(2*r)/(2*r)
+ a*b*d**2*n*log(x)**2 + 2*a*b*d**2*log(c)*log(x) + 4*a*b*d*e*n*x**r*log(x)
/r - 4*a*b*d*e*n*x**r/r**2 + 4*a*b*d*e*x**r*log(c)/r + a*b*e**2*n*x**(2*r)*
```

```
log(x)/r - a*b*e**2*n*x**(2*r)/(2*r**2) + a*b*e**2*x**(2*r)*log(c)/r + b**2
*d**2*n**2*log(x)**3/3 + b**2*d**2*n*log(c)*log(x)**2 + b**2*d**2*log(c)**2
*log(x) + 2*b**2*d*e*n**2*x**r*log(x)**2/r - 4*b**2*d*e*n**2*x**r*log(x)/r*
*2 + 4*b**2*d*e*n**2*x**r/r**3 + 4*b**2*d*e*n*x**r*log(c)*log(x)/r - 4*b**2
*d*e*n*x**r*log(c)/r**2 + 2*b**2*d*e*x**r*log(c)**2/r + b**2*e**2*n**2*x**(
2*r)*log(x)**2/(2*r) - b**2*e**2*n**2*x**(2*r)*log(x)/(2*r**2) + b**2*e**2*
n**2*x**(2*r)/(4*r**3) + b**2*e**2*n*x**(2*r)*log(c)*log(x)/r - b**2*e**2*n
*x**(2*r)*log(c)/(2*r**2) + b**2*e**2*x**(2*r)*log(c)**2/(2*r), Ne(r, 0)),
((d + e)**2*Piecewise(((a**2*log(c*x**n) + a*b*log(c*x**n)**2 + b**2*log(c*
x**n)**3/3)/n, Ne(n, 0)), ((a**2 + 2*a*b*log(c) + b**2*log(c)**2)*log(x), T
rue)), True))
```

3.429 $\int \frac{(d+ex^r)\left(a+b\log(cx^n)\right)^2}{x}\,dx$

Optimal. Leaf size=80

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-\frac{2benx^r\left(a+b\log\left(cx^n\right)\right)}{r^2}+\frac{ex^r\left(a+b\log\left(cx^n\right)\right)^2}{r}+\frac{2b^2en^2x^r}{r^3}$$

```
[Out] 2*b^2*e*n^2*x^r/r^3-2*b*e*n*x^r*(a+b*ln(c*x^n))/r^2+e*x^r*(a+b*ln(c*x^n))^2
/r+1/3*d*(a+b*ln(c*x^n))^3/b/n
```

Rubi [A] time = 0.14, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2353, 2302, 30, 2305, 2304}

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-\frac{2benx^r\left(a+b\log\left(cx^n\right)\right)}{r^2}+\frac{ex^r\left(a+b\log\left(cx^n\right)\right)^2}{r}+\frac{2b^2en^2x^r}{r^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (2*b^2*e*n^2*x^r)/r^3 - (2*b*e*n*x^r*(a + b*Log[c*x^n]))/r^2 + (e*x^r*(a +
b*Log[c*x^n])^2)/r + (d*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int \frac{(d+ex^r)\left(a+b\log(cx^n)\right)^2}{x}\,dx = \int \left(\frac{d\left(a+b\log(cx^n)\right)^2}{x} + ex^{-1+r}\left(a+b\log(cx^n)\right)^2\right)dx$$
$$= d\int \frac{\left(a+b\log(cx^n)\right)^2}{x}\,dx + e\int x^{-1+r}\left(a+b\log(cx^n)\right)^2\,dx$$
$$= \frac{ex^r\left(a+b\log(cx^n)\right)^2}{r} + \frac{d\,\text{Subst}\left(\int x^2\,dx, x, a+b\log(cx^n)\right)}{bn} - \frac{(2ben)\int x^{-}}{}$$
$$= \frac{2b^2en^2x^r}{r^3} - \frac{2benx^r\left(a+b\log(cx^n)\right)}{r^2} + \frac{ex^r\left(a+b\log(cx^n)\right)^2}{r} + \frac{d\left(a+b\log\right.}{3b}$$

Mathematica [A] time = 0.15, size = 109, normalized size = 1.36

$$\frac{ex^r\left(a^2r^2-2abnr+2b^2n^2\right)}{r^3}+a^2d\log(x)+\frac{b\log^2(cx^n)(adr+benx^r)}{nr}-\frac{2bex^r(bn-ar)\log(cx^n)}{r^2}+\frac{b^2d\log^3(cx^n)}{3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (e*(2*b^2*n^2 - 2*a*b*n*r + a^2*r^2)*x^r)/r^3 + a^2*d*Log[x] - (2*b*e*(b*n
- a*r)*x^r*Log[c*x^n])/r^2 + (b*(a*d*r + b*e*n*x^r)*Log[c*x^n]^2)/(n*r) + (
b^2*d*Log[c*x^n]^3)/(3*n)
```

fricas [B] time = 0.82, size = 193, normalized size = 2.41

$$\frac{b^2dn^2r^3\log(x)^3+3\left(b^2dnr^3\log(c)+abdnr^3\right)\log(x)^2+3\left(b^2en^2r^2\log(x)^2+b^2er^2\log(c)^2+2\,b^2en^2-2\,abenr\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))^2/x,x, algorithm="fricas")
```

```
[Out] 1/3*(b^2*d*n^2*r^3*log(x)^3 + 3*(b^2*d*n*r^3*log(c) + a*b*d*n*r^3)*log(x)^2
 + 3*(b^2*e*n^2*r^2*log(x)^2 + b^2*e*r^2*log(c)^2 + 2*b^2*e*n^2 - 2*a*b*e*n
*r + a^2*e*r^2 - 2*(b^2*e*n*r - a*b*e*r^2)*log(c) + 2*(b^2*e*n*r^2*log(c) -
 b^2*e*n^2*r + a*b*e*n*r^2)*log(x))*x^r + 3*(b^2*d*r^3*log(c)^2 + 2*a*b*d*r
^3*log(c) + a^2*d*r^3)*log(x))/r^3
```

giac [B] time = 0.32, size = 219, normalized size = 2.74

$$\frac{1}{3}b^2dn^2\log(x)^3+\frac{b^2n^2x^re\log(x)^2}{r}+b^2dn\log(c)\log(x)^2+\frac{2\,b^2nx^re\log(c)\log(x)}{r}+b^2d\log(c)^2\log(x)+abdn\log(x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))^2/x,x, algorithm="giac")
```

```
[Out] 1/3*b^2*d*n^2*log(x)^3 + b^2*n^2*x^r*e*log(x)^2/r + b^2*d*n*log(c)*log(x)^2
 + 2*b^2*n*x^r*e*log(c)*log(x)/r + b^2*d*log(c)^2*log(x) + a*b*d*n*log(x)^2
 + b^2*x^r*e*log(c)^2/r - 2*b^2*n^2*x^r*e*log(x)/r^2 + 2*a*b*n*x^r*e*log(x)
/r + 2*a*b*d*log(c)*log(x) - 2*b^2*n*x^r*e*log(c)/r^2 + 2*a*b*x^r*e*log(c)/
r + a^2*d*log(x) + 2*b^2*n^2*x^r*e/r^3 - 2*a*b*n*x^r*e/r^2 + a^2*x^r*e/r
```

maple [C] time = 0.47, size = 1712, normalized size = 21.40

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^r+d)*(b*ln(c*x^n)+a)^2/x,x)
```

```
[Out] b^2*d*ln(c)^2*ln(x)+1/3*b^2*d*n^2*ln(x)^3+a^2*d*ln(x)+b^2*(d*r*ln(x)+e*x^r)
/r*ln(x^n)^2+1/r*a^2*e*x^r-b*(-I*Pi*ln(x)*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*r
^2+I*Pi*ln(x)*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*r^2+I*Pi*ln(x)*b*d*cs
gn(I*c*x^n)^3*r^2-I*Pi*ln(x)*b*d*csgn(I*c*x^n)^2*csgn(I*c)*r^2-I*Pi*b*e*csg
n(I*x^n)*csgn(I*c*x^n)^2*x^r*r+I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*x^r*r+I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r-I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^
r*r+b*d*n*ln(x)^2*r^2-2*ln(c)*ln(x)*b*d*r^2-2*b*e*r*x^r*ln(c)-2*ln(x)*a*d*r
^2-2*a*e*r*x^r+2*b*e*n*x^r)/r^2*ln(x^n)+1/2*csgn(I*c)*csgn(I*c*x^n)^3*csgn(
I*x^n)^2*d*b^2*ln(x)*Pi^2-1/4*csgn(I*c*x^n)^4*csgn(I*x^n)^2*d*b^2*ln(x)*Pi^
2+1/2*csgn(I*c*x^n)^5*csgn(I*x^n)*d*b^2*ln(x)*Pi^2+1/2*csgn(I*c)*csgn(I*c*x
^n)^5*d*b^2*ln(x)*Pi^2-1/4*csgn(I*c)^2*csgn(I*c*x^n)^4*d*b^2*ln(x)*Pi^2+I/r
*ln(c)*Pi*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+I/r*ln(c)*Pi*b^2*e*csgn(I*c
*x^n)^2*csgn(I*c)*x^r+I/r*Pi*a*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+I/r*Pi*a
*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-I/r^2*Pi*b^2*e*n*csgn(I*x^n)*csgn(I*c*x^
n)^2*x^r-I/r^2*Pi*b^2*e*n*csgn(I*c*x^n)^2*csgn(I*c)*x^r+1/2*I*ln(x)^2*Pi*b^
2*d*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*ln(c)*Pi*ln(x)*b^2*d*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*ln(x)*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)+I/r^2*Pi*b^2*e*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-I/r*ln(c)*Pi*b
^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-I/r*Pi*a*b*e*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*x^r+2*a*b*d*ln(c)*ln(x)-b^2*d*n*ln(c)*ln(x)^2-a*b*d*n*ln
(x)^2+1/2/r*Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x^r-1/4/r*Pi
^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x^r+I*ln(c)*Pi*ln(x)*b^2
*d*csgn(I*x^n)*csgn(I*c*x^n)^2+I*ln(c)*Pi*ln(x)*b^2*d*csgn(I*c*x^n)^2*csgn(
I*c)+I*Pi*ln(x)*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*ln(x)*a*b*d*csgn(I*c
*x^n)^2*csgn(I*c)-1/r*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*x^r+
1/2/r*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*x^r+I/r^2*Pi*b^2*e
*n*csgn(I*c*x^n)^3*x^r-1/2*I*ln(x)^2*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)^2
-1/2*I*ln(x)^2*Pi*b^2*d*n*csgn(I*c*x^n)^2*csgn(I*c)-I/r*ln(c)*Pi*b^2*e*csgn
(I*c*x^n)^3*x^r-I/r*Pi*a*b*e*csgn(I*c*x^n)^3*x^r+1/r*ln(c)^2*b^2*e*x^r-1/4*
csgn(I*c*x^n)^6*d*b^2*ln(x)*Pi^2+2/r*ln(c)*a*b*e*x^r-2/r^2*ln(c)*b^2*e*n*x^
r-2/r^2*a*b*e*n*x^r-1/4/r*Pi^2*b^2*e*csgn(I*c*x^n)^6*x^r-1/4*csgn(I*c)^2*cs
gn(I*c*x^n)^2*csgn(I*x^n)^2*d*b^2*ln(x)*Pi^2-csgn(I*c)*csgn(I*c*x^n)^4*csgn
(I*x^n)*d*b^2*ln(x)*Pi^2+1/2*csgn(I*c)^2*csgn(I*c*x^n)^3*csgn(I*x^n)*d*b^2*
ln(x)*Pi^2+2*b^2*e*n^2*x^r/r^3-1/4/r*Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)
^4*x^r+1/2/r*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^5*x^r+1/2/r*Pi^2*b^2*e*cs
gn(I*c*x^n)^5*csgn(I*c)*x^r-1/4/r*Pi^2*b^2*e*csgn(I*c*x^n)^4*csgn(I*c)^2*x^
r+1/2*I*ln(x)^2*Pi*b^2*d*n*csgn(I*c*x^n)^3-I*ln(c)*Pi*ln(x)*b^2*d*csgn(I*c*
x^n)^3-I*Pi*ln(x)*a*b*d*csgn(I*c*x^n)^3
```

maxima [A] time = 1.26, size = 131, normalized size = 1.64

$$\frac{b^2ex^r\log\left(cx^n\right)^2}{r}+\frac{b^2d\log\left(cx^n\right)^3}{3\,n}-2\,b^2e\left(\frac{nx^r\log\left(cx^n\right)}{r^2}-\frac{n^2x^r}{r^3}\right)+\frac{2\,abex^r\log\left(cx^n\right)}{r}+\frac{abd\log\left(cx^n\right)^2}{n}+a^2d\log(x)-\frac{2\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))^2/x,x, algorithm="maxima")
```

```
[Out] b^2*e*x^r*log(c*x^n)^2/r + 1/3*b^2*d*log(c*x^n)^3/n - 2*b^2*e*(n*x^r*log(c*
x^n)/r^2 - n^2*x^r/r^3) + 2*a*b*e*x^r*log(c*x^n)/r + a*b*d*log(c*x^n)^2/n +
 a^2*d*log(x) - 2*a*b*e*n*x^r/r^2 + a^2*e*x^r/r
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(d+e\,x^r\right)\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)*(a + b*log(c*x^n))^2)/x,x)
```

```
[Out] int(((d + e*x^r)*(a + b*log(c*x^n))^2)/x, x)
```

sympy [A] time = 25.98, size = 309, normalized size = 3.86

$$\begin{cases} a^2 d \log(x) + \frac{a^2 e x^r}{r} + abdn \log(x)^2 + 2abd \log(c) \log(x) + \frac{2abenx^r \log(x)}{r} - \frac{2abenx^r}{r^2} + \frac{2abex^r \log(c)}{r} + \frac{b^2 dn^2 \log(x)^3}{3} + \\ (d+e) \left(\begin{cases} \frac{a^2 \log(cx^n) + ab \log(cx^n)^2 + \frac{b^2 \log(cx^n)^3}{3}}{n} & \text{for } n \neq 0 \\ \left(a^2 + 2ab \log(c) + b^2 \log(c)^2\right) \log(x) & \text{otherwise} \end{cases} \right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)*(a+b*ln(c*x**n))**2/x,x)
```

```
[Out] Piecewise((a**2*d*log(x) + a**2*e*x**r/r + a*b*d*n*log(x)**2 + 2*a*b*d*log(
c)*log(x) + 2*a*b*e*n*x**r*log(x)/r - 2*a*b*e*n*x**r/r**2 + 2*a*b*e*x**r*lo
g(c)/r + b**2*d*n**2*log(x)**3/3 + b**2*d*n*log(c)*log(x)**2 + b**2*d*log(c
)**2*log(x) + b**2*e*n**2*x**r*log(x)**2/r - 2*b**2*e*n**2*x**r*log(x)/r**2
 + 2*b**2*e*n**2*x**r/r**3 + 2*b**2*e*n*x**r*log(c)*log(x)/r - 2*b**2*e*n*x
**r*log(c)/r**2 + b**2*e*x**r*log(c)**2/r, Ne(r, 0)), ((d + e)*Piecewise(((
a**2*log(c*x**n) + a*b*log(c*x**n)**2 + b**2*log(c*x**n)**3/3)/n, Ne(n, 0))
, ((a**2 + 2*a*b*log(c) + b**2*log(c)**2)*log(x), True)), True))
```

3.430 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)}\,dx$

Optimal. Leaf size=94

$$\frac{2bn\text{Li}_2\left(-\frac{dx^{-r}}{e}\right)(a+b\log(cx^n))}{dr^2}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)(a+b\log(cx^n))^2}{dr}+\frac{2b^2n^2\text{Li}_3\left(-\frac{dx^{-r}}{e}\right)}{dr^3}$$

```
[Out] -(a+b*ln(c*x^n))^2*ln(1+d/e/(x^r))/d/r+2*b*n*(a+b*ln(c*x^n))*polylog(2,-d/e
/(x^r))/d/r^2+2*b^2*n^2*polylog(3,-d/e/(x^r))/d/r^3
```

Rubi [A] time = 0.14, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2345, 2374, 6589}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)(a+b\log(cx^n))}{dr^2}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{dx^{-r}}{e}\right)}{dr^3}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)(a+b\log(cx^n))^2}{dr}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)),x]
```

```
[Out] -(((a + b*Log[c*x^n])^2*Log[1 + d/(e*x^r)])/(d*r)) + (2*b*n*(a + b*Log[c*x^
n])*PolyLog[2, -(d/(e*x^r))])/(d*r^2) + (2*b^2*n^2*PolyLog[3, -(d/(e*x^r))]
)/(d*r^3)
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)}\,dx=-\frac{(a+b\log(cx^n))^2\log\left(1+\frac{dx^{-r}}{e}\right)}{dr}+\frac{(2bn)\int\frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{x}\,dx}{dr}$$

$$=-\frac{(a+b\log(cx^n))^2\log\left(1+\frac{dx^{-r}}{e}\right)}{dr}+\frac{2bn(a+b\log(cx^n))\text{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{dr^2}-\frac{(2b^2n^2)\int\frac{\text{Li}_2(\ldots}{\ldots}}{dr^2}$$

$$=-\frac{(a+b\log(cx^n))^2\log\left(1+\frac{dx^{-r}}{e}\right)}{dr}+\frac{2bn(a+b\log(cx^n))\text{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{dr^2}+\frac{2b^2n^2\text{Li}_3\left(-\frac{d\ldots}{\ldots}\right.}{dr^3}$$

Mathematica [B] time = 0.31, size = 270, normalized size = 2.87

$$-\frac{a^2r^2\log(d-dx^r)-2abr^2\left(n\log(x)-\log(cx^n)\right)\log(d-dx^r)-2abnr\left(\text{Li}_2\left(\frac{ex^r}{d}+1\right)+\left(\log\left(-\frac{ex^r}{d}\right)-r\log(x)\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)),x]
```

```
[Out] -((a^2*r^2*Log[d - d*x^r] - 2*a*b*r^2*(n*Log[x] - Log[c*x^n])*Log[d - d*x^r
] + b^2*r^2*(-(n*Log[x]) + Log[c*x^n])^2*Log[d - d*x^r] - 2*a*b*n*r*((r^2*L
og[x]^2)/2 + (-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2,
1 + (e*x^r)/d]) + 2*b^2*n*r*(n*Log[x] - Log[c*x^n])*((r^2*Log[x]^2)/2 + (-(
r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/d])
+ b^2*n^2*(r^2*Log[x]^2*Log[1 + d/(e*x^r)] - 2*r*Log[x]*PolyLog[2, -(d/(e*x
^r))] - 2*PolyLog[3, -(d/(e*x^r))]))/(d*r^3))
```

fricas [C] time = 0.64, size = 228, normalized size = 2.43

$$\frac{b^2n^2r^3\log(x)^3+6\,b^2n^2\text{polylog}\left(3,-\frac{ex^r}{d}\right)+3\left(b^2nr^3\log(c)+abnr^3\right)\log(x)^2-6\left(b^2n^2r\log(x)+b^2nr\log(c)+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] 1/3*(b^2*n^2*r^3*log(x)^3 + 6*b^2*n^2*polylog(3, -e*x^r/d) + 3*(b^2*n*r^3*l
og(c) + a*b*n*r^3)*log(x)^2 - 6*(b^2*n^2*r*log(x) + b^2*n*r*log(c) + a*b*n*
r)*dilog(-(e*x^r + d)/d + 1) - 3*(b^2*r^2*log(c)^2 + 2*a*b*r^2*log(c) + a^2
*r^2)*log(e*x^r + d) + 3*(b^2*r^3*log(c)^2 + 2*a*b*r^3*log(c) + a^2*r^3)*lo
g(x) - 3*(b^2*n^2*r^2*log(x)^2 + 2*(b^2*n*r^2*log(c) + a*b*n*r^2)*log(x))*l
og((e*x^r + d)/d))/(d*r^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log(cx^n)+a\right)^2}{(ex^r+d)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x^r + d)*x), x)
```

maple [C] time = 0.34, size = 3012, normalized size = 32.04

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x/(e*x^r+d),x)
```

```
[Out] -I/r/d*ln(x^r)*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^3-1/2/r/d*ln(e*x^r+d)*Pi^2*b^2*
csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-2/3*b^2/d*n^2*ln(x)^3-1/4/r/d*ln(x^
r)*Pi^2*b^2*csgn(I*c*x^n)^6+1/4/r/d*ln(e*x^r+d)*Pi^2*b^2*csgn(I*c*x^n)^6+2*
b/r/d*ln(x^r)*ln(x^n)*a+I/r*n/d*ln(x)*ln(1/d*e*x^r+1)*b^2*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-I/r/d*ln(e*x^r+d)*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^2*csgn
(I*c)-I/r/d*ln(e*x^r+d)*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n)^2-2*b/r/d*ln(e*x^r
+d)*ln(x^n)*a+I/r^2*n/d*polylog(2,-1/d*e*x^r)*b^2*Pi*csgn(I*c*x^n)^3+b^2/d*
n*ln(x)^2*ln(x^n)+1/r/d*ln(x^r)*a^2-1/r/d*ln(e*x^r+d)*a^2+I/r/d*ln(e*x^r+d)
*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^3+1/2*I*n/d*ln(x)^2*b^2*Pi*csgn(I*x^n)*csgn(I
```

```
*c*x^n)^2+I/r/d*ln(e*x^r+d)*ln(c)*Pi*b^2*csgn(I*c*x^n)^3-1/4/r/d*ln(x^r)*Pi
^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+2/r/d*ln(x^r)*ln(x^n)*b^2*
ln(c)+2/r/d*ln(x^r)*ln(c)*a*b-2/r/d*ln(e*x^r+d)*ln(c)*a*b-2*b/r^2*n/d*polyl
og(2,-1/d*e*x^r)*a-2/r/d*ln(e*x^r+d)*ln(x^n)*b^2*ln(c)-2/r^2*n/d*polylog(2,
-1/d*e*x^r)*b^2*ln(c)-I/r/d*ln(e*x^r+d)*n*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)+I/r/d*ln(x^r)*n*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)-1/4/r/d*ln(x^r)*Pi^2*b^2*csgn(I*c*x^n)^4*csgn(I*c)^2+1/2/r/d*ln(x^r)*
Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-1/r/d*ln(x^r)*Pi^2*b^2*csg
n(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/2/r/d*ln(x^r)*Pi^2*b^2*csgn(I*x^n)^2*c
sgn(I*c*x^n)^3*csgn(I*c)+1/4/r/d*ln(e*x^r+d)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*
c*x^n)^2*csgn(I*c)^2-I/r/d*ln(e*x^r+d)*n*ln(x)*b^2*Pi*csgn(I*c*x^n)^3-I/r^2
*n/d*polylog(2,-1/d*e*x^r)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/r^2*n/d*pol
ylog(2,-1/d*e*x^r)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+I/r/d*ln(e*x^r+d)*Pi*a*
b*csgn(I*c*x^n)^3-2/r*n/d*ln(x)*ln(1/d*e*x^r+1)*b^2*ln(c)-2/r/d*ln(x^r)*n*l
n(x)*b^2*ln(c)+2/r/d*ln(e*x^r+d)*n*ln(x)*b^2*ln(c)-1/2/r/d*ln(e*x^r+d)*Pi^2
*b^2*csgn(I*c*x^n)^5*csgn(I*c)+I/r/d*ln(x^r)*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^
n)^2+b^2/r/d*ln(x^r)*ln(x)^2*n^2-b^2/r/d*ln(e*x^r+d)*ln(x)^2*n^2+b^2/r*n^2/
d*ln(x)^2*ln(1/d*e*x^r+1)-2*b^2/r^2*n/d*polylog(2,-1/d*e*x^r)*ln(x^n)-I/r/d
*ln(x^r)*Pi*a*b*csgn(I*c*x^n)^3-1/2/r/d*ln(e*x^r+d)*Pi^2*b^2*csgn(I*x^n)*cs
gn(I*c*x^n)^5+I/r/d*ln(e*x^r+d)*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)+I/r/d*ln(e*x^r+d)*n*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/r/d*ln
(e*x^r+d)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)-I/r/d*ln(x^r)*ln(c
)*Pi*b^2*csgn(I*c*x^n)^3-1/2/r/d*ln(e*x^r+d)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*
x^n)^3*csgn(I*c)^2-I/r/d*ln(e*x^r+d)*ln(c)*Pi*b^2*csgn(I*c*x^n)^2*csgn(I*c)
-1/2*I*n/d*ln(x)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I/r/d*ln(x^r)
*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*n/d*ln(x)^2*b^2*Pi*
csgn(I*c*x^n)^3+b^2/d*n*ln(c)*ln(x)^2+1/4/r/d*ln(e*x^r+d)*Pi^2*b^2*csgn(I*c
*x^n)^4*csgn(I*c)^2-1/4/r/d*ln(x^r)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+
2*b/r/d*ln(e*x^r+d)*n*ln(x)*a-2*b/r*n/d*ln(x)*ln(1/d*e*x^r+1)*a+1/4/r/d*ln(
e*x^r+d)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+I/r^2*n/d*polylog(2,-1/d*e*
x^r)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/r/d*ln(e*x^r+d)*ln(c)*Pi*
b^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/r/d*ln(e*x^r+d)*Pi*a*b*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)-2*b/r/d*ln(x^r)*n*ln(x)*a+1/2/r/d*ln(x^r)*Pi^2*b^
2*csgn(I*x^n)*csgn(I*c*x^n)^5+1/2/r/d*ln(x^r)*Pi^2*b^2*csgn(I*c*x^n)^5*csgn
(I*c)-I/r/d*ln(e*x^r+d)*Pi*a*b*csgn(I*c*x^n)^2*csgn(I*c)-I/r/d*ln(e*x^r+d)*
ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*n/d*ln(x)^2*b^2*Pi*csgn(I*c*
x^n)^2*csgn(I*c)-I/r/d*ln(x^r)*n*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+a*b
/d*n*ln(x)^2-2*b^2/r/d*ln(x^r)*ln(x)*ln(x^n)*n+2*b^2/r/d*ln(e*x^r+d)*ln(x)*
ln(x^n)*n-2*b^2/r*n/d*ln(x)*ln(1/d*e*x^r+1)*ln(x^n)-I/r/d*ln(e*x^r+d)*ln(x^
n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/r/d*ln(e*x^r+d)*ln(c)^2*b^2+1/r/d*l
n(x^r)*ln(c)^2*b^2-b^2/r/d*ln(e*x^r+d)*ln(x^n)^2+2*b^2/r^3*n^2/d*polylog(3,
-1/d*e*x^r)+b^2/r/d*ln(x^r)*ln(x^n)^2+I/r/d*ln(x^r)*Pi*a*b*csgn(I*c*x^n)^2*
csgn(I*c)+I/r/d*ln(x^r)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I/r/d*ln(x
^r)*ln(c)*Pi*b^2*csgn(I*c*x^n)^2*csgn(I*c)-I/r*n/d*ln(x)*ln(1/d*e*x^r+1)*b^
2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/r*n/d*ln(x)*ln(1/d*e*x^r+1)*b^2*Pi*csgn(
I*c*x^n)^2*csgn(I*c)-I/r/d*ln(x^r)*n*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)
^2+I/r/d*ln(e*x^r+d)*n*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I/r/d*ln(x^
r)*n*ln(x)*b^2*Pi*csgn(I*c*x^n)^3+I/r/d*ln(x^r)*ln(x^n)*b^2*Pi*csgn(I*c*x^n
)^2*csgn(I*c)+I/r*n/d*ln(x)*ln(1/d*e*x^r+1)*b^2*Pi*csgn(I*c*x^n)^3+I/r/d*ln
(x^r)*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/r/d*ln(x^r)*Pi*a*b*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I/r/d*ln(x^r)*ln(x^n)*b^2*Pi*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a^{2}\left(\frac{\log(x)}{d}-\frac{\log\left(\frac{ex^{r}+d}{e}\right)}{dr}\right)+\int\frac{b^{2}\log(c)^{2}+b^{2}\log\left(x^{n}\right)^{2}+2\,ab\log(c)+2\left(b^{2}\log(c)+ab\right)\log\left(x^{n}\right)}{exx^{r}+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] a^2*(log(x)/d - log((e*x^r + d)/e)/(d*r)) + integrate((b^2*log(c)^2 + b^2*l
og(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e*x*x^r + d*x),
x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\ln(c\,x^n))^2}{x\,(d+e\,x^r)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x*(d + e*x^r)),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(x*(d + e*x^r)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(d+e*x**r),x)
```

```
[Out] Timed out
```

3.431 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)^2}\,dx$

Optimal. Leaf size=182

$$\frac{2bn\text{Li}_2\left(-\frac{dx^{-r}}{e}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2r^2}+\frac{2bn\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2r^2}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)^2}{d^2r}+\frac{(a+b\log}{dr(d}$$

```
[Out] (a+b*ln(c*x^n))^2/d/r/(d+e*x^r)+2*b*n*(a+b*ln(c*x^n))*ln(1+d/e/(x^r))/d^2/r
^2-(a+b*ln(c*x^n))^2*ln(1+d/e/(x^r))/d^2/r-2*b^2*n^2*polylog(2,-d/e/(x^r))/
d^2/r^3+2*b*n*(a+b*ln(c*x^n))*polylog(2,-d/e/(x^r))/d^2/r^2+2*b^2*n^2*polyl
og(3,-d/e/(x^r))/d^2/r^3
```

Rubi [A] time = 0.43, antiderivative size = 182, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {2349, 2345, 2374, 6589, 2338, 2391}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2r^2}-\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^2r^3}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{dx^{-r}}{e}\right)}{d^2r^3}+\frac{2bn\log\left(\frac{dx^{-r}}{e}+\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)^2),x]
```

```
[Out] (a + b*Log[c*x^n])^2/(d*r*(d + e*x^r)) + (2*b*n*(a + b*Log[c*x^n])*Log[1 +
d/(e*x^r)])/(d^2*r^2) - ((a + b*Log[c*x^n])^2*Log[1 + d/(e*x^r)])/(d^2*r) -
 (2*b^2*n^2*PolyLog[2, -(d/(e*x^r))])/(d^2*r^3) + (2*b*n*(a + b*Log[c*x^n])
*PolyLog[2, -(d/(e*x^r))])/(d^2*r^2) + (2*b^2*n^2*PolyLog[3, -(d/(e*x^r))])
/(d^2*r^3)
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
```

```
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x\left(d+ex^r\right)^2}\,dx = \frac{\int \frac{\left(a+b\log(cx^n)\right)^2}{x(d+ex^r)}\,dx}{d} - \frac{e\int \frac{x^{-1+r}\left(a+b\log(cx^n)\right)^2}{(d+ex^r)^2}\,dx}{d}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^2}{dr\left(d+ex^r\right)} - \frac{\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} + \frac{(2bn)\int \frac{\left(a+b\log(cx^n)\right)\log\left(1+\frac{dx^{-r}}{e}\right)}{x}}{d^2r}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^2}{dr\left(d+ex^r\right)} + \frac{2bn\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r^2} - \frac{\left(a+b\log\left(cx^n\right)\right)^2\log\left(1\right.}{d^2r}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^2}{dr\left(d+ex^r\right)} + \frac{2bn\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r^2} - \frac{\left(a+b\log\left(cx^n\right)\right)^2\log\left(1\right.}{d^2r}$$

Mathematica [B] time = 0.40, size = 397, normalized size = 2.18

$$-a^2r^2\log\left(d-dx^r\right) + \frac{dr^2\left(a+b\log(cx^n)\right)^2}{d+ex^r} + 2abr^2\left(n\log(x)-\log\left(cx^n\right)\right)\log\left(d-dx^r\right) + 2abnr\left(\mathrm{Li}_2\left(\frac{ex^r}{d}+1\right) + \left(\log\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)^2),x]
```

```
[Out] ((d*r^2*(a + b*Log[c*x^n])^2)/(d + e*x^r) + 2*a*b*n*r*Log[d - d*x^r] - a^2*
r^2*Log[d - d*x^r] + 2*a*b*r^2*(n*Log[x] - Log[c*x^n])*Log[d - d*x^r] + 2*b
^2*n*r*(-(n*Log[x]) + Log[c*x^n])*Log[d - d*x^r] - b^2*r^2*(-(n*Log[x]) + L
og[c*x^n])^2*Log[d - d*x^r] - 2*b^2*n^2*((r^2*Log[x]^2)/2 + (-(r*Log[x]) +
Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/d]) + 2*a*b*n*r*
((r^2*Log[x]^2)/2 + (-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + Poly
Log[2, 1 + (e*x^r)/d]) + 2*b^2*n*r*(-(n*Log[x]) + Log[c*x^n])*((r^2*Log[x]^
2)/2 + (-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e
*x^r)/d]) - b^2*n^2*(r^2*Log[x]^2*Log[1 + d/(e*x^r)] - 2*r*Log[x]*PolyLog[2
, -(d/(e*x^r))] - 2*PolyLog[3, -(d/(e*x^r))]))/(d^2*r^3)
```

fricas [C] time = 0.62, size = 600, normalized size = 3.30

$$b^2dn^2r^3\log(x)^3 + 3\,b^2dr^2\log(c)^2 + 6\,abdr^2\log(c) + 3\,a^2dr^2 + 3\left(b^2dnr^3\log(c) + abdnr^3\right)\log(x)^2 + \left(b^2en^2r^3\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] 1/3*(b^2*d*n^2*r^3*log(x)^3 + 3*b^2*d*r^2*log(c)^2 + 6*a*b*d*r^2*log(c) + 3
*a^2*d*r^2 + 3*(b^2*d*n*r^3*log(c) + a*b*d*n*r^3)*log(x)^2 + (b^2*e*n^2*r^3
*log(x)^3 + 3*(b^2*e*n*r^3*log(c) - b^2*e*n^2*r^2 + a*b*e*n*r^3)*log(x)^2 +
 3*(b^2*e*r^3*log(c)^2 - 2*a*b*e*n*r^2 + a^2*e*r^3 - 2*(b^2*e*n*r^2 - a*b*e
*r^3)*log(c))*log(x))*x^r - 6*(b^2*d*n^2*r*log(x) + b^2*d*n*r*log(c) - b^2*
d*n^2 + a*b*d*n*r + (b^2*e*n^2*r*log(x) + b^2*e*n*r*log(c) - b^2*e*n^2 + a*
b*e*n*r)*x^r)*dilog(-(e*x^r + d)/d + 1) - 3*(b^2*d*r^2*log(c)^2 - 2*a*b*d*n
*r + a^2*d*r^2 + (b^2*e*r^2*log(c)^2 - 2*a*b*e*n*r + a^2*e*r^2 - 2*(b^2*e*n
*r - a*b*e*r^2)*log(c))*x^r - 2*(b^2*d*n*r - a*b*d*r^2)*log(c))*log(e*x^r +
 d) + 3*(b^2*d*r^3*log(c)^2 + 2*a*b*d*r^3*log(c) + a^2*d*r^3)*log(x) - 3*(b
^2*d*n^2*r^2*log(x)^2 + (b^2*e*n^2*r^2*log(x)^2 + 2*(b^2*e*n*r^2*log(c) - b
^2*e*n^2*r + a*b*e*n*r^2)*log(x))*x^r + 2*(b^2*d*n*r^2*log(c) - b^2*d*n^2*r
 + a*b*d*n*r^2)*log(x))*log((e*x^r + d)/d) + 6*(b^2*e*n^2*x^r + b^2*d*n^2)*
polylog(3, -e*x^r/d))/(d^2*e*r^3*x^r + d^3*r^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)^{2}}{\left(ex^{r}+d\right)^{2}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x^r + d)^2*x), x)
```

maple [F] time = 0.98, size = 0, normalized size = 0.00

$$\int \frac{\left(b\ln\left(c\,x^{n}\right)+a\right)^{2}}{\left(e\,x^{r}+d\right)^{2}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x/(e*x^r+d)^2,x)
```

```
[Out] int((b*ln(c*x^n)+a)^2/x/(e*x^r+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a^{2}\left(\frac{1}{derx^{r}+d^{2}r}+\frac{\log(x)}{d^{2}}-\frac{\log\left(\frac{ex^{r}+d}{e}\right)}{d^{2}r}\right)+\int \frac{b^{2}\log(c)^{2}+b^{2}\log\left(x^{n}\right)^{2}+2\,ab\log(c)+2\left(b^{2}\log(c)+ab\right)\log\left(x^{n}\right)}{e^{2}xx^{2\,r}+2\,dexx^{r}+d^{2}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] a^2*(1/(d*e*r*x^r + d^2*r) + log(x)/d^2 - log((e*x^r + d)/e)/(d^2*r)) + int
egrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)
*log(x^n))/(e^2*x*x^(2*r) + 2*d*e*x*x^r + d^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(a+b\,\ln\left(c\,x^{n}\right)\right)}^{2}}{x\,{\left(d+e\,x^{r}\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x*(d + e*x^r)^2),x)
```

```
[Out] int((a + b*log(c*x^n))^2/(x*(d + e*x^r)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

3.432 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)^3}\,dx$

Optimal. Leaf size=267

$$\frac{2bn\mathrm{Li}_2\left(-\frac{dx^{-r}}{e}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3r^2}+\frac{3bn\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3r^2}+\frac{benx^r\left(a+b\log\left(cx^n\right)\right)}{d^3r^2\left(d+ex^r\right)}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a\right.}{d^3r}$$

```
[Out] b*e*n*x^r*(a+b*ln(c*x^n))/d^3/r^2/(d+e*x^r)+1/2*(a+b*ln(c*x^n))^2/d/r/(d+e*
x^r)^2+(a+b*ln(c*x^n))^2/d^2/r/(d+e*x^r)+3*b*n*(a+b*ln(c*x^n))*ln(1+d/e/(x^
r))/d^3/r^2-(a+b*ln(c*x^n))^2*ln(1+d/e/(x^r))/d^3/r-b^2*n^2*ln(d+e*x^r)/d^3
/r^3-3*b^2*n^2*polylog(2,-d/e/(x^r))/d^3/r^3+2*b*n*(a+b*ln(c*x^n))*polylog(
2,-d/e/(x^r))/d^3/r^2+2*b^2*n^2*polylog(3,-d/e/(x^r))/d^3/r^3
```

Rubi [A] time = 0.89, antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {2349, 2345, 2374, 6589, 2338, 2391, 2335, 260}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)\left(a+b\log\left(cx^n\right)\right)}{d^3r^2}-\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^3r^3}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{dx^{-r}}{e}\right)}{d^3r^3}+\frac{benx^r\left(a+b\log\right.}{d^3r^2\left(d+ex\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)^3),x]
```

```
[Out] (b*e*n*x^r*(a + b*Log[c*x^n]))/(d^3*r^2*(d + e*x^r)) + (a + b*Log[c*x^n])^2
/(2*d*r*(d + e*x^r)^2) + (a + b*Log[c*x^n])^2/(d^2*r*(d + e*x^r)) + (3*b*n*
(a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d^3*r^2) - ((a + b*Log[c*x^n])^2*Lo
g[1 + d/(e*x^r)])/(d^3*r) - (b^2*n^2*Log[d + e*x^r])/(d^3*r^3) - (3*b^2*n^2
*PolyLog[2, -(d/(e*x^r))])/(d^3*r^3) + (2*b*n*(a + b*Log[c*x^n])*PolyLog[2,
 -(d/(e*x^r))])/(d^3*r^2) + (2*b^2*n^2*PolyLog[3, -(d/(e*x^r))])/(d^3*r^3)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
```

```
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x\left(d+ex^r\right)^3}\,dx = \frac{\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x\left(d+ex^r\right)^2}\,dx}{d} - \frac{e\int \frac{x^{-1+r}\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex^r\right)^3}\,dx}{d}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2dr\left(d+ex^r\right)^2} + \frac{\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x\left(d+ex^r\right)}\,dx}{d^2} - \frac{e\int \frac{x^{-1+r}\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex^r\right)^2}\,dx}{d^2} - \frac{(bn)\int \frac{a+b\log\left(cx^n\right)}{x\left(d+ex^r\right)^2}}{dr}$$

$$= \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2dr\left(d+ex^r\right)^2} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^2r\left(d+ex^r\right)} - \frac{\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{dx^{-r}}{e}\right)}{d^3r} + \frac{(2bn)}{}$$

$$= \frac{benx^r\left(a+b\log\left(cx^n\right)\right)}{d^3r^2\left(d+ex^r\right)} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2dr\left(d+ex^r\right)^2} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^2r\left(d+ex^r\right)} + \frac{3bn\left(a+b\log\left(\right.\right.}{}$$

$$= \frac{benx^r\left(a+b\log\left(cx^n\right)\right)}{d^3r^2\left(d+ex^r\right)} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2dr\left(d+ex^r\right)^2} + \frac{\left(a+b\log\left(cx^n\right)\right)^2}{d^2r\left(d+ex^r\right)} + \frac{3bn\left(a+b\log\left(\right.\right.}{}$$

Mathematica [A] time = 0.61, size = 459, normalized size = 1.72

$$\frac{-2a^2r^2\log\left(d-dx^r\right) + \frac{d^2r^2\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex^r\right)^2} + \frac{2dr\left(a+b\log\left(cx^n\right)\right)\left(ar+br\log\left(cx^n\right)-bn\right)}{d+ex^r} + 4abr^2\left(n\log(x)-\log\left(cx^n\right)\right)\log\left(d-\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)^3),x]
```

```
[Out] ((d^2*r^2*(a + b*Log[c*x^n])^2)/(d + e*x^r)^2 + (2*d*r*(a + b*Log[c*x^n])*(
-(b*n) + a*r + b*r*Log[c*x^n]))/(d + e*x^r) - 2*b^2*n^2*Log[d - d*x^r] + 6*
a*b*n*r*Log[d - d*x^r] - 2*a^2*r^2*Log[d - d*x^r] + 4*a*b*r^2*(n*Log[x] - L
og[c*x^n])*Log[d - d*x^r] + 6*b^2*n*r*(-(n*Log[x]) + Log[c*x^n])*Log[d - d*
x^r] - 2*b^2*r^2*(-(n*Log[x]) + Log[c*x^n])^2*Log[d - d*x^r] - 6*b^2*n^2*((
r^2*Log[x]^2)/2 + (-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLo
g[2, 1 + (e*x^r)/d]) + 4*a*b*n*r*((r^2*Log[x]^2)/2 + (-(r*Log[x]) + Log[-((
e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/d]) + 4*b^2*n*r*(-(n*Lo
g[x]) + Log[c*x^n])*((r^2*Log[x]^2)/2 + (-(r*Log[x]) + Log[-((e*x^r)/d)])*L
og[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/d]) - 2*b^2*n^2*(r^2*Log[x]^2*Log[1
+ d/(e*x^r)] - 2*r*Log[x]*PolyLog[2, -(d/(e*x^r))] - 2*PolyLog[3, -(d/(e*x^
r))]))/(2*d^3*r^3)
```

fricas [C] time = 0.80, size = 1165, normalized size = 4.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^3,x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^2*d^2*n^2*r^3*log(x)^3 + 9*b^2*d^2*r^2*log(c)^2 - 6*a*b*d^2*n*r +
9*a^2*d^2*r^2 + 6*(b^2*d^2*n*r^3*log(c) + a*b*d^2*n*r^3)*log(x)^2 + (2*b^2*
e^2*n^2*r^3*log(x)^3 + 3*(2*b^2*e^2*n*r^3*log(c) - 3*b^2*e^2*n^2*r^2 + 2*a*
b*e^2*n*r^3)*log(x)^2 + 6*(b^2*e^2*r^3*log(c)^2 + b^2*e^2*n^2*r - 3*a*b*e^2
*n*r^2 + a^2*e^2*r^3 - (3*b^2*e^2*n*r^2 - 2*a*b*e^2*r^3)*log(c))*log(x))*x^
(2*r) + 2*(2*b^2*d*e*n^2*r^3*log(x)^3 + 3*b^2*d*e*r^2*log(c)^2 - 3*a*b*d*e*
n*r + 3*a^2*d*e*r^2 + 6*(b^2*d*e*n*r^3*log(c) - b^2*d*e*n^2*r^2 + a*b*d*e*n
*r^3)*log(x)^2 - 3*(b^2*d*e*n*r - 2*a*b*d*e*r^2)*log(c) + 3*(2*b^2*d*e*r^3*
log(c)^2 + b^2*d*e*n^2*r - 4*a*b*d*e*n*r^2 + 2*a^2*d*e*r^3 - 4*(b^2*d*e*n*r
^2 - a*b*d*e*r^3)*log(c))*log(x))*x^r - 6*(2*b^2*d^2*n^2*r*log(x) + 2*b^2*d
^2*n*r*log(c) - 3*b^2*d^2*n^2 + 2*a*b*d^2*n*r + (2*b^2*e^2*n^2*r*log(x) + 2
*b^2*e^2*n*r*log(c) - 3*b^2*e^2*n^2 + 2*a*b*e^2*n*r)*x^(2*r) + 2*(2*b^2*d*e
*n^2*r*log(x) + 2*b^2*d*e*n*r*log(c) - 3*b^2*d*e*n^2 + 2*a*b*d*e*n*r)*x^r)*
dilog(-(e*x^r + d)/d + 1) - 6*(b^2*d^2*r^2*log(c)^2 + b^2*d^2*n^2 - 3*a*b*d
^2*n*r + a^2*d^2*r^2 + (b^2*e^2*r^2*log(c)^2 + b^2*e^2*n^2 - 3*a*b*e^2*n*r
+ a^2*e^2*r^2 - (3*b^2*e^2*n*r - 2*a*b*e^2*r^2)*log(c))*x^(2*r) + 2*(b^2*d*
e*r^2*log(c)^2 + b^2*d*e*n^2 - 3*a*b*d*e*n*r + a^2*d*e*r^2 - (3*b^2*d*e*n*r
 - 2*a*b*d*e*r^2)*log(c))*x^r - (3*b^2*d^2*n*r - 2*a*b*d^2*r^2)*log(c))*log
(e*x^r + d) - 6*(b^2*d^2*n*r - 3*a*b*d^2*r^2)*log(c) + 6*(b^2*d^2*r^3*log(c
)^2 + 2*a*b*d^2*r^3*log(c) + a^2*d^2*r^3)*log(x) - 6*(b^2*d^2*n^2*r^2*log(x
)^2 + (b^2*e^2*n^2*r^2*log(x)^2 + (2*b^2*e^2*n*r^2*log(c) - 3*b^2*e^2*n^2*r
 + 2*a*b*e^2*n*r^2)*log(x))*x^(2*r) + 2*(b^2*d*e*n^2*r^2*log(x)^2 + (2*b^2*
d*e*n*r^2*log(c) - 3*b^2*d*e*n^2*r + 2*a*b*d*e*n*r^2)*log(x))*x^r + (2*b^2*
d^2*n*r^2*log(c) - 3*b^2*d^2*n^2*r + 2*a*b*d^2*n*r^2)*log(x))*log((e*x^r +
d)/d) + 12*(b^2*e^2*n^2*x^(2*r) + 2*b^2*d*e*n^2*x^r + b^2*d^2*n^2)*polylog(
3, -e*x^r/d))/(d^3*e^2*r^3*x^(2*r) + 2*d^4*e*r^3*x^r + d^5*r^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \log \left(cx^{n}\right) + a\right)^{2}}{\left(ex^{r} + d\right)^{3} x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x^r + d)^3*x), x)
```

maple [F] time = 0.85, size = 0, normalized size = 0.00

$$\int \frac{\left(b \ln \left(c \,x^{n}\right)+a \right)^{2}}{\left(e \,x^{r}+d \right)^{3} x}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)^2/x/(e*x^r+d)^3,x)
[Out] int((b*ln(c*x^n)+a)^2/x/(e*x^r+d)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a^{2}\left(\frac{2\,ex^{r}+3\,d}{d^{2}e^{2}rx^{2\,r}+2\,d^{3}erx^{r}+d^{4}r}+\frac{2\,\log(x)}{d^{3}}-\frac{2\,\log\left(\frac{ex^{r}+d}{e}\right)}{d^{3}r}\right)+\int\frac{b^{2}\log(c)^{2}+b^{2}\log\left(x^{n}\right)^{2}+2\,ab\log(c)+2\,\left(b^{2}\right.}{e^{3}xx^{3\,r}+3\,de^{2}xx^{2\,r}+3\,d^{2}exx^{r}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^3,x, algorithm="maxima")
[Out] 1/2*a^2*((2*e*x^r + 3*d)/(d^2*e^2*r*x^(2*r) + 2*d^3*e*r*x^r + d^4*r) + 2*lo
g(x)/d^3 - 2*log((e*x^r + d)/e)/(d^3*r)) + integrate((b^2*log(c)^2 + b^2*lo
g(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e^3*x*x^(3*r) + 3
*d*e^2*x*x^(2*r) + 3*d^2*e*x*x^r + d^3*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2}{x\,{\left(d+e\,x^r\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))^2/(x*(d + e*x^r)^3),x)
[Out] int((a + b*log(c*x^n))^2/(x*(d + e*x^r)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(d+e*x**r)**3,x)
[Out] Timed out
```

3.433 $\int \frac{(d+ex^r)^{5/2}\left(a+b\log(cx^n)\right)}{x}\,dx$

Optimal. Leaf size=327

$$\frac{2}{15}\left(-\frac{15d^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}+\frac{15d^2\sqrt{d+ex^r}}{r}+\frac{5d\,(d+ex^r)^{3/2}}{r}+\frac{3\,(d+ex^r)^{5/2}}{r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{2bd^{5/2}n\mathrm{Li}_2\left(1\right.}{r}$$

```
[Out] -32/45*b*d*n*(d+e*x^r)^(3/2)/r^2-4/25*b*n*(d+e*x^r)^(5/2)/r^2+92/15*b*d^(5/
2)*n*arctanh((d+e*x^r)^(1/2)/d^(1/2))/r^2+2*b*d^(5/2)*n*arctanh((d+e*x^r)^(
1/2)/d^(1/2))^2/r^2-4*b*d^(5/2)*n*arctanh((d+e*x^r)^(1/2)/d^(1/2))*ln(2*d^(
1/2)/(d^(1/2)-(d+e*x^r)^(1/2)))/r^2-2*b*d^(5/2)*n*polylog(2,1-2*d^(1/2)/(d^
(1/2)-(d+e*x^r)^(1/2)))/r^2-92/15*b*d^2*n*(d+e*x^r)^(1/2)/r^2+2/15*(a+b*ln(
c*x^n))*(5*d*(d+e*x^r)^(3/2)/r+3*(d+e*x^r)^(5/2)/r-15*d^(5/2)*arctanh((d+e*
x^r)^(1/2)/d^(1/2))/r+15*d^2*(d+e*x^r)^(1/2)/r)
```

Rubi [A] time = 0.48, antiderivative size = 327, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 50, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2bd^{5/2}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{r^2}+\frac{2}{15}\left(\frac{15d^2\sqrt{d+ex^r}}{r}-\frac{15d^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}+\frac{5d\,(d+ex^r)^{3/2}}{r}+\frac{3\,(d+ex}{r}\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^(5/2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-92*b*d^2*n*Sqrt[d + e*x^r])/(15*r^2) - (32*b*d*n*(d + e*x^r)^(3/2))/(45*r
^2) - (4*b*n*(d + e*x^r)^(5/2))/(25*r^2) + (92*b*d^(5/2)*n*ArcTanh[Sqrt[d +
 e*x^r]/Sqrt[d]])/(15*r^2) + (2*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]
]^2)/r^2 + (2*((15*d^2*Sqrt[d + e*x^r])/r + (5*d*(d + e*x^r)^(3/2))/r + (3*
(d + e*x^r)^(5/2))/r - (15*d^(5/2)*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/r)*(a
+ b*Log[c*x^n]))/15 - (4*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(
2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2 - (2*b*d^(5/2)*n*PolyLog[2, 1
- (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d+ex^r)^{5/2}\left(a+b\log(cx^n)\right)}{x}\,dx = \frac{2}{15}\left(\frac{15d^2\sqrt{d+ex^r}}{r} + \frac{5d\,(d+ex^r)^{3/2}}{r} + \frac{3\,(d+ex^r)^{5/2}}{r} - \frac{15d^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right.}{r}\right.$$

$$= \frac{2}{15}\left(\frac{15d^2\sqrt{d+ex^r}}{r} + \frac{5d\,(d+ex^r)^{3/2}}{r} + \frac{3\,(d+ex^r)^{5/2}}{r} - \frac{15d^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right.}{r}\right.$$

$$= \frac{2}{15}\left(\frac{15d^2\sqrt{d+ex^r}}{r} + \frac{5d\,(d+ex^r)^{3/2}}{r} + \frac{3\,(d+ex^r)^{5/2}}{r} - \frac{15d^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right.}{r}\right.$$

$$= -\frac{4bd^2n\sqrt{d+ex^r}}{r^2} - \frac{4bdn\,(d+ex^r)^{3/2}}{9r^2} - \frac{4bn\,(d+ex^r)^{5/2}}{25r^2} + \frac{2}{15}\left(\frac{15d^2\sqrt{d+ex}}{r}\right.$$

$$= -\frac{16bd^2n\sqrt{d+ex^r}}{3r^2} - \frac{32bdn\,(d+ex^r)^{3/2}}{45r^2} - \frac{4bn\,(d+ex^r)^{5/2}}{25r^2} + \frac{2bd^{5/2}n\tanh^{-1}}{r^2}$$

$$= -\frac{92bd^2n\sqrt{d+ex^r}}{15r^2} - \frac{32bdn\,(d+ex^r)^{3/2}}{45r^2} - \frac{4bn\,(d+ex^r)^{5/2}}{25r^2} + \frac{4bd^{5/2}n\tanh^{-1}}{r^2}$$

$$= -\frac{92bd^2n\sqrt{d+ex^r}}{15r^2} - \frac{32bdn\,(d+ex^r)^{3/2}}{45r^2} - \frac{4bn\,(d+ex^r)^{5/2}}{25r^2} + \frac{16bd^{5/2}n\tanh}{3r^2}$$

$$= -\frac{92bd^2n\sqrt{d+ex^r}}{15r^2} - \frac{32bdn\,(d+ex^r)^{3/2}}{45r^2} - \frac{4bn\,(d+ex^r)^{5/2}}{25r^2} + \frac{92bd^{5/2}n\tanh}{15r^2}$$

Mathematica [F] time = 0.55, size = 0, normalized size = 0.00

$$\int \frac{(d+ex^r)^{5/2}\left(a+b\log(cx^n)\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^r)^(5/2)*(a + b*Log[c*x^n]))/x,x]
[Out] Integrate[((d + e*x^r)^(5/2)*(a + b*Log[c*x^n]))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(5/2)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r + d)^{\frac{5}{2}} \left(b \log (cx^n) + a\right)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(5/2)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^(5/2)*(b*log(c*x^n) + a)/x, x)
```

maple [F] time = 0.59, size = 0, normalized size = 0.00

$$\int \frac{(e\,x^r + d)^{\frac{5}{2}} (b \ln (c\,x^n) + a)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^r+d)^(5/2)*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] int((e*x^r+d)^(5/2)*(b*ln(c*x^n)+a)/x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{15}\left(\frac{15\, d^{\frac{5}{2}} \log\left(\frac{\sqrt{ex^r+d}-\sqrt{d}}{\sqrt{ex^r+d}+\sqrt{d}}\right)}{r} + \frac{2\left(3\,(ex^r + d)^{\frac{5}{2}} + 5\,(ex^r + d)^{\frac{3}{2}} d + 15\,\sqrt{ex^r + d}\, d^2\right)}{r}\right) a + b \int \frac{\left(e^2 x^{2\,r} \log(c) + 2\, dex^r \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(5/2)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] 1/15*(15*d^(5/2)*log((sqrt(e*x^r + d) - sqrt(d))/(sqrt(e*x^r + d) + sqrt(d)
))/r + 2*(3*(e*x^r + d)^(5/2) + 5*(e*x^r + d)^(3/2)*d + 15*sqrt(e*x^r + d)*
d^2)/r)*a + b*integrate((e^2*x^(2*r)*log(c) + 2*d*e*x^r*log(c) + d^2*log(c)
 + (e^2*x^(2*r) + 2*d*e*x^r + d^2)*log(x^n))*sqrt(e*x^r + d)/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(d + e\,x^r\right)}^{5/2}\,\left(a + b\,\ln\left(c\,x^n\right)\right)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^(5/2)*(a + b*log(c*x^n)))/x,x)
```

```
[Out] int(((d + e*x^r)^(5/2)*(a + b*log(c*x^n)))/x, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**(5/2)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Timed out
```

3.434 $\int \frac{(d+ex^r)^{3/2}\left(a+b\log(cx^n)\right)}{x}\,dx$

Optimal. Leaf size=284

$$\frac{2}{3}\left(-\frac{3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}+\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{2bd^{3/2}n\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^r+d}}\right)}{r^2}+\frac{2bd^{3/2}r}{}$$

```
[Out] -4/9*b*n*(d+e*x^r)^(3/2)/r^2+16/3*b*d^(3/2)*n*arctanh((d+e*x^r)^(1/2)/d^(1/
2))/r^2+2*b*d^(3/2)*n*arctanh((d+e*x^r)^(1/2)/d^(1/2))^2/r^2-4*b*d^(3/2)*n*
arctanh((d+e*x^r)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(1/2)-(d+e*x^r)^(1/2)))/r^
2-2*b*d^(3/2)*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(d+e*x^r)^(1/2)))/r^2-16/3*b
*d*n*(d+e*x^r)^(1/2)/r^2+2/3*(a+b*ln(c*x^n))*((d+e*x^r)^(3/2)/r-3*d^(3/2)*a
rctanh((d+e*x^r)^(1/2)/d^(1/2))/r+3*d*(d+e*x^r)^(1/2)/r)
```

Rubi [A] time = 0.39, antiderivative size = 284, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 50, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2bd^{3/2}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{r^2}+\frac{2}{3}\left(-\frac{3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}+\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}\right)\left(a+b\log\left(cx^n\right)\right)$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^(3/2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-16*b*d*n*Sqrt[d + e*x^r])/(3*r^2) - (4*b*n*(d + e*x^r)^(3/2))/(9*r^2) + (
16*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/(3*r^2) + (2*b*d^(3/2)*n*A
rcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/r^2 + (2*((3*d*Sqrt[d + e*x^r])/r + (d +
 e*x^r)^(3/2)/r - (3*d^(3/2)*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/r)*(a + b*Lo
g[c*x^n]))/3 - (4*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[
d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2 - (2*b*d^(3/2)*n*PolyLog[2, 1 - (2*Sq
rt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(d+ex^r)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}\,dx = \frac{2}{3}\left(\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}-\frac{3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)\left(a+b\log\left(cx^n\right)\right)-$$

$$=\frac{2}{3}\left(\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}-\frac{3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)\left(a+b\log\left(cx^n\right)\right)-$$

$$=\frac{2}{3}\left(\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}-\frac{3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)\left(a+b\log\left(cx^n\right)\right)-$$

$$=-\frac{4bdn\sqrt{d+ex^r}}{r^2}-\frac{4bn\,(d+ex^r)^{3/2}}{9r^2}+\frac{2}{3}\left(\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}-\frac{3d^{3/2}}{}\right.$$

$$=-\frac{16bdn\sqrt{d+ex^r}}{3r^2}-\frac{4bn\,(d+ex^r)^{3/2}}{9r^2}+\frac{2bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{r^2}+\frac{2}{3}\left(3d\sqrt{}\right.$$

$$=-\frac{16bdn\sqrt{d+ex^r}}{3r^2}-\frac{4bn\,(d+ex^r)^{3/2}}{9r^2}+\frac{4bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r^2}+\frac{2bd^{3/2}n\,\mathrm{t}}{}$$

$$=-\frac{16bdn\sqrt{d+ex^r}}{3r^2}-\frac{4bn\,(d+ex^r)^{3/2}}{9r^2}+\frac{16bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3r^2}+\frac{2bd^{3/2}n}{}$$

$$=-\frac{16bdn\sqrt{d+ex^r}}{3r^2}-\frac{4bn\,(d+ex^r)^{3/2}}{9r^2}+\frac{16bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3r^2}+\frac{2bd^{3/2}n}{}$$

Mathematica [F] time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{(d+ex^r)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^r)^(3/2)*(a + b*Log[c*x^n]))/x,x]
[Out] Integrate[((d + e*x^r)^(3/2)*(a + b*Log[c*x^n]))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ex^r + d)^{\frac{3}{2}}\left(b\log\left(cx^n\right) + a\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^(3/2)*(b*log(c*x^n) + a)/x, x)
```

maple [F] time = 0.54, size = 0, normalized size = 0.00

$$\int \frac{(e\,x^r + d)^{\frac{3}{2}}\,(b\ln(c\,x^n) + a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^r+d)^(3/2)*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] int((e*x^r+d)^(3/2)*(b*ln(c*x^n)+a)/x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\left(\frac{3\,d^{\frac{3}{2}}\log\left(\frac{\sqrt{ex^r+d}-\sqrt{d}}{\sqrt{ex^r+d}+\sqrt{d}}\right)}{r} + \frac{2\left((ex^r + d)^{\frac{3}{2}} + 3\,\sqrt{ex^r + d}\,d\right)}{r}\right)a + b\int \frac{\left(ex^r\log(c) + d\log(c) + (ex^r + d)\log\left(x^n\right)\right)\sqrt{}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] 1/3*(3*d^(3/2)*log((sqrt(e*x^r + d) - sqrt(d))/(sqrt(e*x^r + d) + sqrt(d)))
/r + 2*((e*x^r + d)^(3/2) + 3*sqrt(e*x^r + d)*d)/r)*a + b*integrate((e*x^r*
log(c) + d*log(c) + (e*x^r + d)*log(x^n))*sqrt(e*x^r + d)/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(d+e\,x^r\right)}^{3/2}\,\left(a+b\,\ln\left(c\,x^n\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^(3/2)*(a + b*log(c*x^n)))/x,x)
```

```
[Out] int(((d + e*x^r)^(3/2)*(a + b*log(c*x^n)))/x, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**(3/2)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Timed out
```

3.435 $\int \frac{\sqrt{d+ex^r}\left(a+b\log(cx^n)\right)}{x}\,dx$

Optimal. Leaf size=240

$$2\left(\frac{\sqrt{d+ex^r}}{r}-\frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{2b\sqrt{d}\,n\mathrm{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^r+d}}\right)}{r^2}-\frac{4bn\sqrt{d+ex^r}}{r^2}+\frac{2b\sqrt{d}\,n\tanh}{r}$$

```
[Out] 4*b*n*arctanh((d+e*x^r)^(1/2)/d^(1/2))*d^(1/2)/r^2+2*b*n*arctanh((d+e*x^r)^
(1/2)/d^(1/2))^2*d^(1/2)/r^2-4*b*n*arctanh((d+e*x^r)^(1/2)/d^(1/2))*ln(2*d^
(1/2)/(d^(1/2)-(d+e*x^r)^(1/2)))*d^(1/2)/r^2-2*b*n*polylog(2,1-2*d^(1/2)/(d
^(1/2)-(d+e*x^r)^(1/2)))*d^(1/2)/r^2-4*b*n*(d+e*x^r)^(1/2)/r^2+2*(a+b*ln(c*
x^n))*(-arctanh((d+e*x^r)^(1/2)/d^(1/2))*d^(1/2)/r+(d+e*x^r)^(1/2)/r)
```

Rubi [A] time = 0.32, antiderivative size = 240, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 50, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2b\sqrt{d}\,n\mathrm{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{r^2}+2\left(\frac{\sqrt{d+ex^r}}{r}-\frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{4bn\sqrt{d+ex^r}}{r^2}+\frac{2b}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^r]*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-4*b*n*Sqrt[d + e*x^r])/r^2 + (4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[
d]])/r^2 + (2*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/r^2 + 2*(Sqrt
[d + e*x^r]/r - (Sqrt[d]*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/r)*(a + b*Log[c*
x^n]) - (4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sq
rt[d] - Sqrt[d + e*x^r])])/r^2 - (2*b*Sqrt[d]*n*PolyLog[2, 1 - (2*Sqrt[d])/
(Sqrt[d] - Sqrt[d + e*x^r])])/r^2
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^r}\,(a+b\log(cx^n))}{x}dx = 2\left(\frac{\sqrt{d+ex^r}}{r} - \frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n)) - (bn)\int\left(\frac{2\sqrt{d+ex^r}}{rx}\right.$$

$$= 2\left(\frac{\sqrt{d+ex^r}}{r} - \frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n)) - \frac{(2bn)\int\frac{\sqrt{d+ex^r}}{x}dx}{r} +$$

$$= 2\left(\frac{\sqrt{d+ex^r}}{r} - \frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n)) - \frac{(2bn)\,\mathrm{Subst}\left(\int\frac{\sqrt{d+e}}{x}\right.}{r^2}$$

$$= -\frac{4bn\sqrt{d+ex^r}}{r^2} + 2\left(\frac{\sqrt{d+ex^r}}{r} - \frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n)) + \frac{(4}{}$$

$$= -\frac{4bn\sqrt{d+ex^r}}{r^2} + \frac{2b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{r^2} + 2\left(\frac{\sqrt{d+ex^r}}{r} - \frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d}}{}\right.}{r}\right.$$

$$= -\frac{4bn\sqrt{d+ex^r}}{r^2} + \frac{4b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r^2} + \frac{2b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{r^2} + 2\left(\right.$$

$$= -\frac{4bn\sqrt{d+ex^r}}{r^2} + \frac{4b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r^2} + \frac{2b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{r^2} + 2\left(\right.$$

$$= -\frac{4bn\sqrt{d+ex^r}}{r^2} + \frac{4b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r^2} + \frac{2b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{r^2} + 2\left(\right.$$

Mathematica [F] time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d+ex^r}\,(a+b\log(cx^n))}{x}dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(Sqrt[d + e*x^r]*(a + b*Log[c*x^n]))/x,x]
[Out] Integrate[(Sqrt[d + e*x^r]*(a + b*Log[c*x^n]))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(1/2)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ex^r + d}\left(b\log\left(cx^n\right) + a\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(1/2)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^r + d)*(b*log(c*x^n) + a)/x, x)
```

maple [F] time = 0.58, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\,x^r + d}\,\left(b\ln\left(c\,x^n\right) + a\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^r+d)^(1/2)*(b*ln(c*x^n)+a)/x,x)
```

```
[Out] int((e*x^r+d)^(1/2)*(b*ln(c*x^n)+a)/x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{\sqrt{d}\,\log\left(\frac{\sqrt{ex^r+d}-\sqrt{d}}{\sqrt{ex^r+d}+\sqrt{d}}\right)}{r} + \frac{2\,\sqrt{ex^r + d}}{r}\right) + b\int \frac{\sqrt{ex^r + d}\left(\log(c) + \log\left(x^n\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(1/2)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] a*(sqrt(d)*log((sqrt(e*x^r + d) - sqrt(d))/(sqrt(e*x^r + d) + sqrt(d)))/r +
 2*sqrt(e*x^r + d)/r) + b*integrate(sqrt(e*x^r + d)*(log(c) + log(x^n))/x,
x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{d + e\,x^r}\,\left(a + b\,\ln\left(c\,x^n\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^(1/2)*(a + b*log(c*x^n)))/x,x)
```

```
[Out] int(((d + e*x^r)^(1/2)*(a + b*log(c*x^n)))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b\log\left(cx^n\right)\right)\sqrt{d + ex^r}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**(1/2)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**r)/x, x)
```

3.436 $\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex^r}}\,dx$

Optimal. Leaf size=174

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\,r}-\frac{2bn\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^r+d}}\right)}{\sqrt{d}\,r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}\,r^2}-\frac{4bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)\tan}{\sqrt{d}\,r^2}$$

```
[Out] 2*b*n*arctanh((d+e*x^r)^(1/2)/d^(1/2))^2/r^2/d^(1/2)-2*arctanh((d+e*x^r)^(1
/2)/d^(1/2))*(a+b*ln(c*x^n))/r/d^(1/2)-4*b*n*arctanh((d+e*x^r)^(1/2)/d^(1/2
))*ln(2*d^(1/2)/(d^(1/2)-(d+e*x^r)^(1/2)))/r^2/d^(1/2)-2*b*n*polylog(2,1-2*
d^(1/2)/(d^(1/2)-(d+e*x^r)^(1/2)))/r^2/d^(1/2)
```

Rubi [A] time = 0.27, antiderivative size = 174, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 63, 208, 2348, 12, 5984, 5918, 2402, 2315}

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{\sqrt{d}\,r^2}-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\,r}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}\,r^2}-\frac{4bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+}}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x^r]),x]
```

```
[Out] (2*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/(Sqrt[d]*r^2) - (2*ArcTanh[Sqrt[
d + e*x^r]/Sqrt[d]]*(a + b*Log[c*x^n]))/(Sqrt[d]*r) - (4*b*n*ArcTanh[Sqrt[d
 + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/(Sqrt[d]*r
^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/(Sqrt
[d]*r^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex^r}}\,dx = -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\,r} - (bn)\int -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{\sqrt{d}\,rx}\,dx$$

$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\,r} + \frac{(2bn)\int \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{x}\,dx}{\sqrt{d}\,r}$$

$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\,r} + \frac{(2bn)\,\text{Subst}\left(\int \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}\,dx, x, x^r\right)}{\sqrt{d}\,r^2}$$

$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\,r} + \frac{(4bn)\,\text{Subst}\left(\int \frac{x\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{-d+x^2}\,dx, x, \sqrt{d+ex^r}\right)}{\sqrt{d}\,r^2}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}\,r^2} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\,r} - \frac{(4bn)\,\text{Subst}\left(\int \frac{\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{1-\frac{x}{\sqrt{d}}}\right.}{dr^2}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}\,r^2} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\,r} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\log\left(\right.}{\sqrt{d}\,r^2}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}\,r^2} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\,r} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\log\left(\right.}{\sqrt{d}\,r^2}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}\,r^2} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\left(a+b\log(cx^n)\right)}{\sqrt{d}\,r} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\log\left(\right.}{\sqrt{d}\,r^2}$$

Mathematica [F] time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex^r}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x^r]),x]
[Out] Integrate[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x^r]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log\left(cx^{n}\right)+a}{\sqrt{ex^{r}+d}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(1/2),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^r + d)*x), x)
```

maple [F] time = 0.68, size = 0, normalized size = 0.00

$$\int \frac{b\ln\left(c\,x^{n}\right)+a}{\sqrt{e\,x^{r}+d}\;x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^r+d)^(1/2),x)
[Out] int((b*ln(c*x^n)+a)/x/(e*x^r+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b\int \frac{\log(c)+\log\left(x^{n}\right)}{\sqrt{ex^{r}+d}\,x}\,dx+\frac{a\log\left(\frac{\sqrt{ex^{r}+d}-\sqrt{d}}{\sqrt{ex^{r}+d}+\sqrt{d}}\right)}{\sqrt{d}\,r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(1/2),x, algorithm="maxima")
[Out] b*integrate((log(c) + log(x^n))/(sqrt(e*x^r + d)*x), x) + a*log((sqrt(e*x^r
 + d) - sqrt(d))/(sqrt(e*x^r + d) + sqrt(d)))/(sqrt(d)*r)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\ln\left(c\,x^{n}\right)}{x\,\sqrt{d+e\,x^{r}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^r)^(1/2)),x)
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^r)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\log\left(cx^{n}\right)}{x\sqrt{d+ex^{r}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r)**(1/2),x)
[Out] Integral((a + b*log(c*x**n))/(x*sqrt(d + e*x**r)), x)
```

3.437 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{3/2}}\,dx$

Optimal. Leaf size=225

$$2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{2bn\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^r+d}}\right)}{d^{3/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2}+\frac{4bn\tanh}{d^{3}}$$

```
[Out] 4*b*n*arctanh((d+e*x^r)^(1/2)/d^(1/2))/d^(3/2)/r^2+2*b*n*arctanh((d+e*x^r)^
(1/2)/d^(1/2))^2/d^(3/2)/r^2-4*b*n*arctanh((d+e*x^r)^(1/2)/d^(1/2))*ln(2*d^
(1/2)/(d^(1/2)-(d+e*x^r)^(1/2)))/d^(3/2)/r^2-2*b*n*polylog(2,1-2*d^(1/2)/(d
^(1/2)-(d+e*x^r)^(1/2)))/d^(3/2)/r^2+2*(a+b*ln(c*x^n))*(-arctanh((d+e*x^r)^
(1/2)/d^(1/2))/d^(3/2)/r+1/d/r/(d+e*x^r)^(1/2))
```

Rubi [A] time = 0.34, antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {266, 51, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{d^{3/2}r^2}+2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2}+$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(3/2)),x]
```

```
[Out] (4*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/(d^(3/2)*r^2) + (2*b*n*ArcTanh[Sqr
t[d + e*x^r]/Sqrt[d]]^2)/(d^(3/2)*r^2) + 2*(1/(d*r*Sqrt[d + e*x^r]) - ArcTa
nh[Sqrt[d + e*x^r]/Sqrt[d]]/(d^(3/2)*r))*(a + b*Log[c*x^n]) - (4*b*n*ArcTan
h[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/(d
^(3/2)*r^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])
])/(d^(3/2)*r^2)
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{3/2}}\,dx = 2\left(\frac{1}{dr\sqrt{d+ex^r}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)\left(a+b\log(cx^n)\right) - (bn)\int\left(\frac{2}{drx\sqrt{d+ex^r}} - \frac{2\tanh^{-1}}{d^{3/2}}\right.$$

$$= 2\left(\frac{1}{dr\sqrt{d+ex^r}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)\left(a+b\log(cx^n)\right) + \frac{(2bn)\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{x}\,dx}{d^{3/2}r} - \frac{(2bn)}{}$$

$$= 2\left(\frac{1}{dr\sqrt{d+ex^r}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)\left(a+b\log(cx^n)\right) + \frac{(2bn)\,\mathrm{Subst}\left(\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}\,dx, x,\right.}{d^{3/2}r^2}$$

$$= 2\left(\frac{1}{dr\sqrt{d+ex^r}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)\left(a+b\log(cx^n)\right) + \frac{(4bn)\,\mathrm{Subst}\left(\int\frac{x\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{-d+x^2}\,dx, x,\right.}{d^{3/2}r^2}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r^2} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2} + 2\left(\frac{1}{dr\sqrt{d+ex^r}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r^2} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2} + 2\left(\frac{1}{dr\sqrt{d+ex^r}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r^2} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2} + 2\left(\frac{1}{dr\sqrt{d+ex^r}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r^2} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2} + 2\left(\frac{1}{dr\sqrt{d+ex^r}} - \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+$$

Mathematica [F] time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(3/2)),x]
[Out] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\log(cx^n)+a}{(ex^r+d)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^(3/2)*x), x)
```

maple [F] time = 0.40, size = 0, normalized size = 0.00

$$\int \frac{b\ln(c\,x^n)+a}{(e\,x^r+d)^{\frac{3}{2}}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^r+d)^(3/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x/(e*x^r+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{\log\left(\frac{\sqrt{ex^r+d}-\sqrt{d}}{\sqrt{ex^r+d}+\sqrt{d}}\right)}{d^{\frac{3}{2}}r}+\frac{2}{\sqrt{ex^r+d}\,dr}\right)+b\int\frac{\log(c)+\log(x^n)}{(exx^r+dx)\sqrt{ex^r+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(3/2),x, algorithm="maxima")
```

```
[Out] a*(log((sqrt(e*x^r + d) - sqrt(d))/(sqrt(e*x^r + d) + sqrt(d)))/(d^(3/2)*r)
 + 2/(sqrt(e*x^r + d)*d*r)) + b*integrate((log(c) + log(x^n))/((e*x*x^r + d
*x)*sqrt(e*x^r + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\ln(c\,x^n)}{x\,(d+e\,x^r)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^r)^(3/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^r)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r)**(3/2),x)
```

```
[Out] Timed out
```

3.438 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{5/2}}\,dx$

Optimal. Leaf size=271

$$\frac{2}{3}\left(-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}+\frac{3}{d^2r\sqrt{d+ex^r}}+\frac{1}{dr\left(d+ex^r\right)^{3/2}}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{2bn\text{Li}_2\left(1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{ex^r+d}}\right)}{d^{5/2}r^2}+\frac{2bn\tanh^{-1}}{d^{5/}}$$

```
[Out] 16/3*b*n*arctanh((d+e*x^r)^(1/2)/d^(1/2))/d^(5/2)/r^2+2*b*n*arctanh((d+e*x^
r)^(1/2)/d^(1/2))^2/d^(5/2)/r^2-4*b*n*arctanh((d+e*x^r)^(1/2)/d^(1/2))*ln(2
*d^(1/2)/(d^(1/2)-(d+e*x^r)^(1/2)))/d^(5/2)/r^2-2*b*n*polylog(2,1-2*d^(1/2)
/(d^(1/2)-(d+e*x^r)^(1/2)))/d^(5/2)/r^2+2/3*(a+b*ln(c*x^n))*(1/d/r/(d+e*x^r
)^(3/2)-3*arctanh((d+e*x^r)^(1/2)/d^(1/2))/d^(5/2)/r+3/d^2/r/(d+e*x^r)^(1/2
))-4/3*b*n/d^2/r^2/(d+e*x^r)^(1/2)
```

Rubi [A] time = 0.42, antiderivative size = 271, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 51, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{d^{5/2}r^2}+\frac{2}{3}\left(\frac{3}{d^2r\sqrt{d+ex^r}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}+\frac{1}{dr\left(d+ex^r\right)^{3/2}}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{}{3d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(5/2)),x]
```

```
[Out] (-4*b*n)/(3*d^2*r^2*Sqrt[d + e*x^r]) + (16*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt
[d]])/(3*d^(5/2)*r^2) + (2*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/(d^(5/2)
*r^2) + (2*(1/(d*r*(d + e*x^r)^(3/2)) + 3/(d^2*r*Sqrt[d + e*x^r]) - (3*ArcT
anh[Sqrt[d + e*x^r]/Sqrt[d]])/(d^(5/2)*r))*(a + b*Log[c*x^n]))/3 - (4*b*n*A
rcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])
])/(d^(5/2)*r^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*
x^r])])/(d^(5/2)*r^2)
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{5/2}}\,dx = \frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d+ex^r}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}\right)(a+b\log(cx^n))-(bn)\int\left(\frac{}{3drx}\right.$$

$$=\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d+ex^r}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}\right)(a+b\log(cx^n))+\frac{(2bn)\int\frac{\tanh^{-1}}{}}{d^{5/2}}$$

$$=\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d+ex^r}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}\right)(a+b\log(cx^n))+\frac{(2bn)\,\text{Subst}\left(\right.}{}$$

$$=-\frac{4bn}{3d^2r^2\sqrt{d+ex^r}}+\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d+ex^r}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}\right)(a+b\log(cx$$

$$=-\frac{4bn}{3d^2r^2\sqrt{d+ex^r}}+\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{5/2}r^2}+\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\right.$$

$$=-\frac{4bn}{3d^2r^2\sqrt{d+ex^r}}+\frac{16bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3d^{5/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{5/2}r^2}+\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\right.$$

$$=-\frac{4bn}{3d^2r^2\sqrt{d+ex^r}}+\frac{16bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3d^{5/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{5/2}r^2}+\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\right.$$

$$=-\frac{4bn}{3d^2r^2\sqrt{d+ex^r}}+\frac{16bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3d^{5/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{5/2}r^2}+\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\right.$$

Mathematica [**F**] time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(5/2)),x]
[Out] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(5/2)), x]
```

fricas [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b \log(cx^n) + a}{(ex^r + d)^{\frac{5}{2}} x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^(5/2)*x), x)
```

maple [F] time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{b \ln(c\, x^n) + a}{(e\, x^r + d)^{\frac{5}{2}} x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^r+d)^(5/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x/(e*x^r+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3} a \left(\frac{3 \log\left(\frac{\sqrt{ex^r+d} - \sqrt{d}}{\sqrt{ex^r+d} + \sqrt{d}}\right)}{d^{\frac{5}{2}} r} + \frac{2\,(3\,ex^r + 4\,d)}{(ex^r + d)^{\frac{3}{2}} d^2 r} \right) + b \int \frac{\log(c) + \log(x^n)}{\left(e^2 x x^{2r} + 2\,dexx^r + d^2 x\right)\sqrt{ex^r + d}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(3*log((sqrt(e*x^r + d) - sqrt(d))/(sqrt(e*x^r + d) + sqrt(d)))/(d^(5
/2)*r) + 2*(3*e*x^r + 4*d)/((e*x^r + d)^(3/2)*d^2*r)) + b*integrate((log(c)
 + log(x^n))/((e^2*x*x^(2*r) + 2*d*e*x*x^r + d^2*x)*sqrt(e*x^r + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b\, \ln(c\, x^n)}{x\, (d + e\, x^r)^{5/2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^r)^(5/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^r)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r)**(5/2),x)
```

```
[Out] Timed out
```

3.439 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{7/2}}\,dx$

Optimal. Leaf size=314

$$\frac{2}{15}\left(-\frac{15\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r}+\frac{15}{d^3r\sqrt{d+ex^r}}+\frac{5}{d^2r\left(d+ex^r\right)^{3/2}}+\frac{3}{dr\left(d+ex^r\right)^{5/2}}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{2bn\mathrm{Li}_2\left(1-\frac{2}{\sqrt{d}-}\right.}{d^{7/2}r^2}$$

```
[Out] -4/15*b*n/d^2/r^2/(d+e*x^r)^(3/2)+92/15*b*n*arctanh((d+e*x^r)^(1/2)/d^(1/2)
)/d^(7/2)/r^2+2*b*n*arctanh((d+e*x^r)^(1/2)/d^(1/2))^2/d^(7/2)/r^2-4*b*n*ar
ctanh((d+e*x^r)^(1/2)/d^(1/2))*ln(2*d^(1/2)/(d^(1/2)-(d+e*x^r)^(1/2)))/d^(7
/2)/r^2-2*b*n*polylog(2,1-2*d^(1/2)/(d^(1/2)-(d+e*x^r)^(1/2)))/d^(7/2)/r^2+
2/15*(a+b*ln(c*x^n))*(3/d/r/(d+e*x^r)^(5/2)+5/d^2/r/(d+e*x^r)^(3/2)-15*arct
anh((d+e*x^r)^(1/2)/d^(1/2))/d^(7/2)/r+15/d^3/r/(d+e*x^r)^(1/2))-32/15*b*n/
d^3/r^2/(d+e*x^r)^(1/2)
```

Rubi [A] time = 0.47, antiderivative size = 314, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {266, 51, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{d^{7/2}r^2}+\frac{2}{15}\left(\frac{15}{d^3r\sqrt{d+ex^r}}+\frac{5}{d^2r\left(d+ex^r\right)^{3/2}}-\frac{15\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r}+\frac{3}{dr\left(d+ex^r\right)^{5/2}}\right)\Bigg($$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(7/2)),x]
```

```
[Out] (-4*b*n)/(15*d^2*r^2*(d + e*x^r)^(3/2)) - (32*b*n)/(15*d^3*r^2*Sqrt[d + e*x
^r]) + (92*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/(15*d^(7/2)*r^2) + (2*b*n*
ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/(d^(7/2)*r^2) + (2*(3/(d*r*(d + e*x^r)^
(5/2)) + 5/(d^2*r*(d + e*x^r)^(3/2)) + 15/(d^3*r*Sqrt[d + e*x^r]) - (15*Arc
Tanh[Sqrt[d + e*x^r]/Sqrt[d]])/(d^(7/2)*r))*(a + b*Log[c*x^n]))/15 - (4*b*n
*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r
])])/(d^(7/2)*r^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d +
e*x^r])])/(d^(7/2)*r^2)
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{7/2}}\,dx = \frac{2}{15}\left(\frac{3}{dr(d+ex^r)^{5/2}}+\frac{5}{d^2r(d+ex^r)^{3/2}}+\frac{15}{d^3r\sqrt{d+ex^r}}-\frac{15\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r}\right)(a+b\log(c$$

$$=\frac{2}{15}\left(\frac{3}{dr(d+ex^r)^{5/2}}+\frac{5}{d^2r(d+ex^r)^{3/2}}+\frac{15}{d^3r\sqrt{d+ex^r}}-\frac{15\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r}\right)(a+b\log(c$$

$$=\frac{2}{15}\left(\frac{3}{dr(d+ex^r)^{5/2}}+\frac{5}{d^2r(d+ex^r)^{3/2}}+\frac{15}{d^3r\sqrt{d+ex^r}}-\frac{15\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r}\right)(a+b\log(c$$

$$=-\frac{4bn}{15d^2r^2(d+ex^r)^{3/2}}-\frac{4bn}{3d^3r^2\sqrt{d+ex^r}}+\frac{2}{15}\left(\frac{3}{dr(d+ex^r)^{5/2}}+\frac{5}{d^2r(d+ex^r)^{3/2}}+\frac{15}{d^3r\sqrt{d+}}\right.$$

$$=-\frac{4bn}{15d^2r^2(d+ex^r)^{3/2}}-\frac{32bn}{15d^3r^2\sqrt{d+ex^r}}+\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{7/2}r^2}$$

$$=-\frac{4bn}{15d^2r^2(d+ex^r)^{3/2}}-\frac{32bn}{15d^3r^2\sqrt{d+ex^r}}+\frac{16bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3d^{7/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{7/2}r^2}$$

$$=-\frac{4bn}{15d^2r^2(d+ex^r)^{3/2}}-\frac{32bn}{15d^3r^2\sqrt{d+ex^r}}+\frac{92bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{15d^{7/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{7/2}r^2}$$

$$=-\frac{4bn}{15d^2r^2(d+ex^r)^{3/2}}-\frac{32bn}{15d^3r^2\sqrt{d+ex^r}}+\frac{92bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{15d^{7/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{7/2}r^2}$$

Mathematica [F] time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{7/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(7/2)),x]
[Out] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(7/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(7/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b \log (cx^n) + a}{(ex^r + d)^{\frac{7}{2}} x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(7/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^(7/2)*x), x)
```

maple [F] time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{b \ln (c\, x^n) + a}{(e\, x^r + d)^{\frac{7}{2}}\, x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*ln(c*x^n)+a)/x/(e*x^r+d)^(7/2),x)
```

```
[Out] int((b*ln(c*x^n)+a)/x/(e*x^r+d)^(7/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{15} a \left(\frac{15 \log \left(\frac{\sqrt{ex^r+d} - \sqrt{d}}{\sqrt{ex^r+d} + \sqrt{d}} \right)}{d^{\frac{7}{2}} r} + \frac{2 \left(15 (ex^r + d)^2 + 5 (ex^r + d) d + 3 d^2\right)}{(ex^r + d)^{\frac{5}{2}} d^3 r} \right) + b \int \frac{\log(c) + \log(x^n)}{\left(e^3 x x^{3r} + 3 d e^2 x x^{2r} + 3 d^2 e x x^r + d^3 \right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(7/2),x, algorithm="maxima")
```

```
[Out] 1/15*a*(15*log((sqrt(e*x^r + d) - sqrt(d))/(sqrt(e*x^r + d) + sqrt(d)))/(d^
(7/2)*r) + 2*(15*(e*x^r + d)^2 + 5*(e*x^r + d)*d + 3*d^2)/((e*x^r + d)^(5/2
)*d^3*r)) + b*integrate((log(c) + log(x^n))/((e^3*x*x^(3*r) + 3*d*e^2*x*x^(
2*r) + 3*d^2*e*x*x^r + d^3*x)*sqrt(e*x^r + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b\, \ln (c\, x^n)}{x\, (d + e\, x^r)^{7/2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*log(c*x^n))/(x*(d + e*x^r)^(7/2)),x)
```

```
[Out] int((a + b*log(c*x^n))/(x*(d + e*x^r)^(7/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r)**(7/2),x)
```

```
[Out] Timed out
```

3.440 $\int (fx)^m (d+ex^r)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=233

$$\frac{d^3(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{3d^2ex^{r+1}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{m+r+1}+\frac{3de^2x^{2r+1}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{m+2r+1}+\frac{e^3x^{3r+1}(fx)^m\left(a\right.}{m+3}$$

```
[Out] -3*b*d^2*e*n*x^(1+r)*(f*x)^m/(1+m+r)^2-3*b*d*e^2*n*x^(1+2*r)*(f*x)^m/(1+m+2
*r)^2-b*e^3*n*x^(1+3*r)*(f*x)^m/(1+m+3*r)^2-b*d^3*n*(f*x)^(1+m)/f/(1+m)^2+3
*d^2*e*x^(1+r)*(f*x)^m*(a+b*ln(c*x^n))/(1+m+r)+3*d*e^2*x^(1+2*r)*(f*x)^m*(a
+b*ln(c*x^n))/(1+m+2*r)+e^3*x^(1+3*r)*(f*x)^m*(a+b*ln(c*x^n))/(1+m+3*r)+d^3
*(f*x)^(1+m)*(a+b*ln(c*x^n))/f/(1+m)
```

Rubi [A] time = 1.99, antiderivative size = 233, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {270, 20, 30, 2350, 14}

$$\frac{3d^2ex^{r+1}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{m+r+1}+\frac{d^3(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{3de^2x^{2r+1}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{m+2r+1}+\frac{e^3x^{3r+1}(fx)^m\left(a\right.}{m+3}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (-3*b*d^2*e*n*x^(1 + r)*(f*x)^m)/(1 + m + r)^2 - (3*b*d*e^2*n*x^(1 + 2*r)*(
f*x)^m)/(1 + m + 2*r)^2 - (b*e^3*n*x^(1 + 3*r)*(f*x)^m)/(1 + m + 3*r)^2 - (
b*d^3*n*(f*x)^(1 + m))/(f*(1 + m)^2) + (3*d^2*e*x^(1 + r)*(f*x)^m*(a + b*Lo
g[c*x^n]))/(1 + m + r) + (3*d*e^2*x^(1 + 2*r)*(f*x)^m*(a + b*Log[c*x^n]))/(
1 + m + 2*r) + (e^3*x^(1 + 3*r)*(f*x)^m*(a + b*Log[c*x^n]))/(1 + m + 3*r) +
 (d^3*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
```

```
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int (fx)^m (d+ex^r)^3 \left(a+b\log\left(cx^n\right)\right)dx = \frac{3d^2ex^{1+r}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{1+m+r}+\frac{3de^2x^{1+2r}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{1+m+2r}$$
$$=\frac{3d^2ex^{1+r}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{1+m+r}+\frac{3de^2x^{1+2r}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{1+m+2r}$$
$$=-\frac{bd^3n(fx)^{1+m}}{f(1+m)^2}+\frac{3d^2ex^{1+r}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{1+m+r}+\frac{3de^2x^{1+2r}(fx)^m}{1+n}$$
$$=-\frac{bd^3n(fx)^{1+m}}{f(1+m)^2}+\frac{3d^2ex^{1+r}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{1+m+r}+\frac{3de^2x^{1+2r}(fx)^m}{1+n}$$
$$=-\frac{3bd^2enx^{1+r}(fx)^m}{(1+m+r)^2}-\frac{3bde^2nx^{1+2r}(fx)^m}{(1+m+2r)^2}-\frac{be^3nx^{1+3r}(fx)^m}{(1+m+3r)^2}-\frac{bd^3n(f}{f(1+}$$

Mathematica [A] time = 0.48, size = 178, normalized size = 0.76

$$x(fx)^m\left(\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{m+1}+\frac{3d^2ex^r\left(a+b\log\left(cx^n\right)\right)}{m+r+1}+\frac{3de^2x^{2r}\left(a+b\log\left(cx^n\right)\right)}{m+2r+1}+\frac{e^3x^{3r}\left(a+b\log\left(cx^n\right)\right)}{m+3r+1}-\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^3*n)/(1 + m)^2) - (3*b*d^2*e*n*x^r)/(1 + m + r)^2 - (3*b*
d*e^2*n*x^(2*r))/(1 + m + 2*r)^2 - (b*e^3*n*x^(3*r))/(1 + m + 3*r)^2 + (d^3
*(a + b*Log[c*x^n]))/(1 + m) + (3*d^2*e*x^r*(a + b*Log[c*x^n]))/(1 + m + r)
 + (3*d*e^2*x^(2*r)*(a + b*Log[c*x^n]))/(1 + m + 2*r) + (e^3*x^(3*r)*(a + b
*Log[c*x^n]))/(1 + m + 3*r))
```

fricas [B] time = 1.24, size = 4918, normalized size = 21.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] (((b*e^3*m^7 + 7*b*e^3*m^6 + 21*b*e^3*m^5 + 35*b*e^3*m^4 + 35*b*e^3*m^3 + 2
1*b*e^3*m^2 + 12*(b*e^3*m^2 + 2*b*e^3*m + b*e^3)*r^5 + 7*b*e^3*m + 40*(b*e^
3*m^3 + 3*b*e^3*m^2 + 3*b*e^3*m + b*e^3)*r^4 + b*e^3 + 51*(b*e^3*m^4 + 4*b*
e^3*m^3 + 6*b*e^3*m^2 + 4*b*e^3*m + b*e^3)*r^3 + 31*(b*e^3*m^5 + 5*b*e^3*m^
4 + 10*b*e^3*m^3 + 10*b*e^3*m^2 + 5*b*e^3*m + b*e^3)*r^2 + 9*(b*e^3*m^6 + 6
*b*e^3*m^5 + 15*b*e^3*m^4 + 20*b*e^3*m^3 + 15*b*e^3*m^2 + 6*b*e^3*m + b*e^3
)*r)*x*log(c) + (12*(b*e^3*m^2 + 2*b*e^3*m + b*e^3)*n*r^5 + 40*(b*e^3*m^3 +
 3*b*e^3*m^2 + 3*b*e^3*m + b*e^3)*n*r^4 + 51*(b*e^3*m^4 + 4*b*e^3*m^3 + 6*b
*e^3*m^2 + 4*b*e^3*m + b*e^3)*n*r^3 + 31*(b*e^3*m^5 + 5*b*e^3*m^4 + 10*b*e^
3*m^3 + 10*b*e^3*m^2 + 5*b*e^3*m + b*e^3)*n*r^2 + 9*(b*e^3*m^6 + 6*b*e^3*m^
5 + 15*b*e^3*m^4 + 20*b*e^3*m^3 + 15*b*e^3*m^2 + 6*b*e^3*m + b*e^3)*n*r + (
b*e^3*m^7 + 7*b*e^3*m^6 + 21*b*e^3*m^5 + 35*b*e^3*m^4 + 35*b*e^3*m^3 + 21*b
*e^3*m^2 + 7*b*e^3*m + b*e^3)*n)*x*log(x) + (a*e^3*m^7 + 7*a*e^3*m^6 + 21*a
*e^3*m^5 + 35*a*e^3*m^4 + 35*a*e^3*m^3 + 21*a*e^3*m^2 + 12*(a*e^3*m^2 + 2*a
```

```
*e^3*m + a*e^3)*r^5 + 7*a*e^3*m + 4*(10*a*e^3*m^3 + 30*a*e^3*m^2 + 30*a*e^3
*m + 10*a*e^3 - (b*e^3*m^2 + 2*b*e^3*m + b*e^3)*n)*r^4 + a*e^3 + 3*(17*a*e^
3*m^4 + 68*a*e^3*m^3 + 102*a*e^3*m^2 + 68*a*e^3*m + 17*a*e^3 - 4*(b*e^3*m^3
 + 3*b*e^3*m^2 + 3*b*e^3*m + b*e^3)*n)*r^3 + (31*a*e^3*m^5 + 155*a*e^3*m^4
+ 310*a*e^3*m^3 + 310*a*e^3*m^2 + 155*a*e^3*m + 31*a*e^3 - 13*(b*e^3*m^4 +
4*b*e^3*m^3 + 6*b*e^3*m^2 + 4*b*e^3*m + b*e^3)*n)*r^2 - (b*e^3*m^6 + 6*b*e^
3*m^5 + 15*b*e^3*m^4 + 20*b*e^3*m^3 + 15*b*e^3*m^2 + 6*b*e^3*m + b*e^3)*n +
 3*(3*a*e^3*m^6 + 18*a*e^3*m^5 + 45*a*e^3*m^4 + 60*a*e^3*m^3 + 45*a*e^3*m^2
 + 18*a*e^3*m + 3*a*e^3 - 2*(b*e^3*m^5 + 5*b*e^3*m^4 + 10*b*e^3*m^3 + 10*b*
e^3*m^2 + 5*b*e^3*m + b*e^3)*n)*r)*x)*x^(3*r)*e^(m*log(f) + m*log(x)) + 3*(
(b*d*e^2*m^7 + 7*b*d*e^2*m^6 + 21*b*d*e^2*m^5 + 35*b*d*e^2*m^4 + 35*b*d*e^2
*m^3 + 21*b*d*e^2*m^2 + 18*(b*d*e^2*m^2 + 2*b*d*e^2*m + b*d*e^2)*r^5 + 7*b*
d*e^2*m + 57*(b*d*e^2*m^3 + 3*b*d*e^2*m^2 + 3*b*d*e^2*m + b*d*e^2)*r^4 + b*
d*e^2 + 68*(b*d*e^2*m^4 + 4*b*d*e^2*m^3 + 6*b*d*e^2*m^2 + 4*b*d*e^2*m + b*d
*e^2)*r^3 + 38*(b*d*e^2*m^5 + 5*b*d*e^2*m^4 + 10*b*d*e^2*m^3 + 10*b*d*e^2*m
^2 + 5*b*d*e^2*m + b*d*e^2)*r^2 + 10*(b*d*e^2*m^6 + 6*b*d*e^2*m^5 + 15*b*d*
e^2*m^4 + 20*b*d*e^2*m^3 + 15*b*d*e^2*m^2 + 6*b*d*e^2*m + b*d*e^2)*r)*x*log
(c) + (18*(b*d*e^2*m^2 + 2*b*d*e^2*m + b*d*e^2)*n*r^5 + 57*(b*d*e^2*m^3 + 3
*b*d*e^2*m^2 + 3*b*d*e^2*m + b*d*e^2)*n*r^4 + 68*(b*d*e^2*m^4 + 4*b*d*e^2*m
^3 + 6*b*d*e^2*m^2 + 4*b*d*e^2*m + b*d*e^2)*n*r^3 + 38*(b*d*e^2*m^5 + 5*b*d
*e^2*m^4 + 10*b*d*e^2*m^3 + 10*b*d*e^2*m^2 + 5*b*d*e^2*m + b*d*e^2)*n*r^2 +
 10*(b*d*e^2*m^6 + 6*b*d*e^2*m^5 + 15*b*d*e^2*m^4 + 20*b*d*e^2*m^3 + 15*b*d
*e^2*m^2 + 6*b*d*e^2*m + b*d*e^2)*n*r + (b*d*e^2*m^7 + 7*b*d*e^2*m^6 + 21*b
*d*e^2*m^5 + 35*b*d*e^2*m^4 + 35*b*d*e^2*m^3 + 21*b*d*e^2*m^2 + 7*b*d*e^2*m
 + b*d*e^2)*n)*x*log(x) + (a*d*e^2*m^7 + 7*a*d*e^2*m^6 + 21*a*d*e^2*m^5 + 3
5*a*d*e^2*m^4 + 35*a*d*e^2*m^3 + 21*a*d*e^2*m^2 + 18*(a*d*e^2*m^2 + 2*a*d*e
^2*m + a*d*e^2)*r^5 + 7*a*d*e^2*m + 3*(19*a*d*e^2*m^3 + 57*a*d*e^2*m^2 + 57
*a*d*e^2*m + 19*a*d*e^2 - 3*(b*d*e^2*m^2 + 2*b*d*e^2*m + b*d*e^2)*n)*r^4 +
a*d*e^2 + 4*(17*a*d*e^2*m^4 + 68*a*d*e^2*m^3 + 102*a*d*e^2*m^2 + 68*a*d*e^2
*m + 17*a*d*e^2 - 6*(b*d*e^2*m^3 + 3*b*d*e^2*m^2 + 3*b*d*e^2*m + b*d*e^2)*n
)*r^3 + 2*(19*a*d*e^2*m^5 + 95*a*d*e^2*m^4 + 190*a*d*e^2*m^3 + 190*a*d*e^2*
m^2 + 95*a*d*e^2*m + 19*a*d*e^2 - 11*(b*d*e^2*m^4 + 4*b*d*e^2*m^3 + 6*b*d*e
^2*m^2 + 4*b*d*e^2*m + b*d*e^2)*n)*r^2 - (b*d*e^2*m^6 + 6*b*d*e^2*m^5 + 15*
b*d*e^2*m^4 + 20*b*d*e^2*m^3 + 15*b*d*e^2*m^2 + 6*b*d*e^2*m + b*d*e^2)*n +
2*(5*a*d*e^2*m^6 + 30*a*d*e^2*m^5 + 75*a*d*e^2*m^4 + 100*a*d*e^2*m^3 + 75*a
*d*e^2*m^2 + 30*a*d*e^2*m + 5*a*d*e^2 - 4*(b*d*e^2*m^5 + 5*b*d*e^2*m^4 + 10
*b*d*e^2*m^3 + 10*b*d*e^2*m^2 + 5*b*d*e^2*m + b*d*e^2)*n)*r)*x)*x^(2*r)*e^(
m*log(f) + m*log(x)) + 3*((b*d^2*e*m^7 + 7*b*d^2*e*m^6 + 21*b*d^2*e*m^5 + 3
5*b*d^2*e*m^4 + 35*b*d^2*e*m^3 + 21*b*d^2*e*m^2 + 36*(b*d^2*e*m^2 + 2*b*d^2
*e*m + b*d^2*e)*r^5 + 7*b*d^2*e*m + 96*(b*d^2*e*m^3 + 3*b*d^2*e*m^2 + 3*b*d
^2*e*m + b*d^2*e)*r^4 + b*d^2*e + 97*(b*d^2*e*m^4 + 4*b*d^2*e*m^3 + 6*b*d^2
*e*m^2 + 4*b*d^2*e*m + b*d^2*e)*r^3 + 47*(b*d^2*e*m^5 + 5*b*d^2*e*m^4 + 10*
b*d^2*e*m^3 + 10*b*d^2*e*m^2 + 5*b*d^2*e*m + b*d^2*e)*r^2 + 11*(b*d^2*e*m^6
 + 6*b*d^2*e*m^5 + 15*b*d^2*e*m^4 + 20*b*d^2*e*m^3 + 15*b*d^2*e*m^2 + 6*b*d
^2*e*m + b*d^2*e)*r)*x*log(c) + (36*(b*d^2*e*m^2 + 2*b*d^2*e*m + b*d^2*e)*n
*r^5 + 96*(b*d^2*e*m^3 + 3*b*d^2*e*m^2 + 3*b*d^2*e*m + b*d^2*e)*n*r^4 + 97*
(b*d^2*e*m^4 + 4*b*d^2*e*m^3 + 6*b*d^2*e*m^2 + 4*b*d^2*e*m + b*d^2*e)*n*r^3
 + 47*(b*d^2*e*m^5 + 5*b*d^2*e*m^4 + 10*b*d^2*e*m^3 + 10*b*d^2*e*m^2 + 5*b*
d^2*e*m + b*d^2*e)*n*r^2 + 11*(b*d^2*e*m^6 + 6*b*d^2*e*m^5 + 15*b*d^2*e*m^4
 + 20*b*d^2*e*m^3 + 15*b*d^2*e*m^2 + 6*b*d^2*e*m + b*d^2*e)*n*r + (b*d^2*e*
m^7 + 7*b*d^2*e*m^6 + 21*b*d^2*e*m^5 + 35*b*d^2*e*m^4 + 35*b*d^2*e*m^3 + 21
*b*d^2*e*m^2 + 7*b*d^2*e*m + b*d^2*e)*n)*x*log(x) + (a*d^2*e*m^7 + 7*a*d^2*
e*m^6 + 21*a*d^2*e*m^5 + 35*a*d^2*e*m^4 + 35*a*d^2*e*m^3 + 21*a*d^2*e*m^2 +
 36*(a*d^2*e*m^2 + 2*a*d^2*e*m + a*d^2*e)*r^5 + 7*a*d^2*e*m + 12*(8*a*d^2*e
*m^3 + 24*a*d^2*e*m^2 + 24*a*d^2*e*m + 8*a*d^2*e - 3*(b*d^2*e*m^2 + 2*b*d^2
*e*m + b*d^2*e)*n)*r^4 + a*d^2*e + (97*a*d^2*e*m^4 + 388*a*d^2*e*m^3 + 582*
a*d^2*e*m^2 + 388*a*d^2*e*m + 97*a*d^2*e - 60*(b*d^2*e*m^3 + 3*b*d^2*e*m^2
+ 3*b*d^2*e*m + b*d^2*e)*n)*r^3 + (47*a*d^2*e*m^5 + 235*a*d^2*e*m^4 + 470*a
*d^2*e*m^3 + 470*a*d^2*e*m^2 + 235*a*d^2*e*m + 47*a*d^2*e - 37*(b*d^2*e*m^4
```

```
 + 4*b*d^2*e*m^3 + 6*b*d^2*e*m^2 + 4*b*d^2*e*m + b*d^2*e)*n)*r^2 - (b*d^2*e
*m^6 + 6*b*d^2*e*m^5 + 15*b*d^2*e*m^4 + 20*b*d^2*e*m^3 + 15*b*d^2*e*m^2 + 6
*b*d^2*e*m + b*d^2*e)*n + (11*a*d^2*e*m^6 + 66*a*d^2*e*m^5 + 165*a*d^2*e*m^
4 + 220*a*d^2*e*m^3 + 165*a*d^2*e*m^2 + 66*a*d^2*e*m + 11*a*d^2*e - 10*(b*d
^2*e*m^5 + 5*b*d^2*e*m^4 + 10*b*d^2*e*m^3 + 10*b*d^2*e*m^2 + 5*b*d^2*e*m +
b*d^2*e)*n)*r)*x)*x^r*e^(m*log(f) + m*log(x)) + ((b*d^3*m^7 + 7*b*d^3*m^6 +
 21*b*d^3*m^5 + 35*b*d^3*m^4 + 35*b*d^3*m^3 + 36*(b*d^3*m + b*d^3)*r^6 + 21
*b*d^3*m^2 + 132*(b*d^3*m^2 + 2*b*d^3*m + b*d^3)*r^5 + 7*b*d^3*m + 193*(b*d
^3*m^3 + 3*b*d^3*m^2 + 3*b*d^3*m + b*d^3)*r^4 + b*d^3 + 144*(b*d^3*m^4 + 4*
b*d^3*m^3 + 6*b*d^3*m^2 + 4*b*d^3*m + b*d^3)*r^3 + 58*(b*d^3*m^5 + 5*b*d^3*
m^4 + 10*b*d^3*m^3 + 10*b*d^3*m^2 + 5*b*d^3*m + b*d^3)*r^2 + 12*(b*d^3*m^6
+ 6*b*d^3*m^5 + 15*b*d^3*m^4 + 20*b*d^3*m^3 + 15*b*d^3*m^2 + 6*b*d^3*m + b*
d^3)*r)*x*log(c) + (36*(b*d^3*m + b*d^3)*n*r^6 + 132*(b*d^3*m^2 + 2*b*d^3*m
 + b*d^3)*n*r^5 + 193*(b*d^3*m^3 + 3*b*d^3*m^2 + 3*b*d^3*m + b*d^3)*n*r^4 +
 144*(b*d^3*m^4 + 4*b*d^3*m^3 + 6*b*d^3*m^2 + 4*b*d^3*m + b*d^3)*n*r^3 + 58
*(b*d^3*m^5 + 5*b*d^3*m^4 + 10*b*d^3*m^3 + 10*b*d^3*m^2 + 5*b*d^3*m + b*d^3
)*n*r^2 + 12*(b*d^3*m^6 + 6*b*d^3*m^5 + 15*b*d^3*m^4 + 20*b*d^3*m^3 + 15*b*
d^3*m^2 + 6*b*d^3*m + b*d^3)*n*r + (b*d^3*m^7 + 7*b*d^3*m^6 + 21*b*d^3*m^5
+ 35*b*d^3*m^4 + 35*b*d^3*m^3 + 21*b*d^3*m^2 + 7*b*d^3*m + b*d^3)*n)*x*log(
x) + (a*d^3*m^7 + 7*a*d^3*m^6 + 21*a*d^3*m^5 + 35*a*d^3*m^4 + 35*a*d^3*m^3
+ 36*(a*d^3*m - b*d^3*n + a*d^3)*r^6 + 21*a*d^3*m^2 + 132*(a*d^3*m^2 + 2*a*
d^3*m + a*d^3 - (b*d^3*m + b*d^3)*n)*r^5 + 7*a*d^3*m + 193*(a*d^3*m^3 + 3*a
*d^3*m^2 + 3*a*d^3*m + a*d^3 - (b*d^3*m^2 + 2*b*d^3*m + b*d^3)*n)*r^4 + a*d
^3 + 144*(a*d^3*m^4 + 4*a*d^3*m^3 + 6*a*d^3*m^2 + 4*a*d^3*m + a*d^3 - (b*d^
3*m^3 + 3*b*d^3*m^2 + 3*b*d^3*m + b*d^3)*n)*r^3 + 58*(a*d^3*m^5 + 5*a*d^3*m
^4 + 10*a*d^3*m^3 + 10*a*d^3*m^2 + 5*a*d^3*m + a*d^3 - (b*d^3*m^4 + 4*b*d^3
*m^3 + 6*b*d^3*m^2 + 4*b*d^3*m + b*d^3)*n)*r^2 - (b*d^3*m^6 + 6*b*d^3*m^5 +
 15*b*d^3*m^4 + 20*b*d^3*m^3 + 15*b*d^3*m^2 + 6*b*d^3*m + b*d^3)*n + 12*(a*
d^3*m^6 + 6*a*d^3*m^5 + 15*a*d^3*m^4 + 20*a*d^3*m^3 + 15*a*d^3*m^2 + 6*a*d^
3*m + a*d^3 - (b*d^3*m^5 + 5*b*d^3*m^4 + 10*b*d^3*m^3 + 10*b*d^3*m^2 + 5*b*
d^3*m + b*d^3)*n)*r)*x)*e^(m*log(f) + m*log(x)))/(m^8 + 8*m^7 + 36*(m^2 + 2
*m + 1)*r^6 + 28*m^6 + 132*(m^3 + 3*m^2 + 3*m + 1)*r^5 + 56*m^5 + 193*(m^4
+ 4*m^3 + 6*m^2 + 4*m + 1)*r^4 + 70*m^4 + 144*(m^5 + 5*m^4 + 10*m^3 + 10*m^
2 + 5*m + 1)*r^3 + 56*m^3 + 58*(m^6 + 6*m^5 + 15*m^4 + 20*m^3 + 15*m^2 + 6*
m + 1)*r^2 + 28*m^2 + 12*(m^7 + 7*m^6 + 21*m^5 + 35*m^4 + 35*m^3 + 21*m^2 +
 7*m + 1)*r + 8*m + 1)
```

giac [B] time = 0.79, size = 766, normalized size = 3.29

$$\frac{3\,bd^2f^m mnxx^m x^r e\log(x)}{m^2+2\,mr+r^2+2\,m+2\,r+1}+\frac{3\,bd^2f^m nrxx^m x^r e\log(x)}{m^2+2\,mr+r^2+2\,m+2\,r+1}+\frac{bd^3f^m mnxx^m\log(x)}{m^2+2\,m+1}+\frac{3\,bdf^m mnxx^m x^{2\,r}e}{m^2+4\,mr+4\,r^2+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 3*b*d^2*f^m*m*n*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + 3*
b*d^2*f^m*n*r*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + b*d^
3*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + 3*b*d*f^m*m*n*x*x^m*x^(2*r)*e^2*lo
g(x)/(m^2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) + 6*b*d*f^m*n*r*x*x^m*x^(2*r)*e^
2*log(x)/(m^2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) + 3*b*d^2*f^m*n*x*x^m*x^r*e*
log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) - 3*b*d^2*f^m*n*x*x^m*x^r*e/(m^2
 + 2*m*r + r^2 + 2*m + 2*r + 1) + 3*b*d^2*f^m*x*x^m*x^r*e*log(c)/(m + r + 1
) + b*d^3*f^m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*m*n*x*x^m*x^(3*r)*e^3*
log(x)/(m^2 + 6*m*r + 9*r^2 + 2*m + 6*r + 1) + 3*b*f^m*n*r*x*x^m*x^(3*r)*e^
3*log(x)/(m^2 + 6*m*r + 9*r^2 + 2*m + 6*r + 1) + 3*b*d*f^m*n*x*x^m*x^(2*r)*
e^2*log(x)/(m^2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) - b*d^3*f^m*n*x*x^m/(m^2 +
 2*m + 1) - 3*b*d*f^m*n*x*x^m*x^(2*r)*e^2/(m^2 + 4*m*r + 4*r^2 + 2*m + 4*r
+ 1) + 3*a*d^2*f^m*x*x^m*x^r*e/(m + r + 1) + 3*b*d*f^m*x*x^m*x^(2*r)*e^2*lo
g(c)/(m + 2*r + 1) + b*f^m*n*x*x^m*x^(3*r)*e^3*log(x)/(m^2 + 6*m*r + 9*r^2
```

```
+ 2*m + 6*r + 1) - b*f^m*n*x*x^m*x^(3*r)*e^3/(m^2 + 6*m*r + 9*r^2 + 2*m + 6
*r + 1) + 3*a*d*f^m*x*x^m*x^(2*r)*e^2/(m + 2*r + 1) + (f*x)^m*b*d^3*x*log(c
)/(m + 1) + b*f^m*x*x^m*x^(3*r)*e^3*log(c)/(m + 3*r + 1) + (f*x)^m*a*d^3*x/
(m + 1) + a*f^m*x*x^m*x^(3*r)*e^3/(m + 3*r + 1)
```

maple [C] time = 2.06, size = 22706, normalized size = 97.45

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^r+d)^3*(b*ln(c*x^n)+a),x)
```

```
[Out] result too large to display
```

maxima [A] time = 1.60, size = 343, normalized size = 1.47

$$\frac{be^3 f^m x e^{(m\log(x)+3r\log(x))}\log(cx^n)}{m+3r+1}+\frac{3\,bde^2 f^m x e^{(m\log(x)+2r\log(x))}\log(cx^n)}{m+2r+1}+\frac{3\,bd^2 e f^m x e^{(m\log(x)+r\log(x))}\log(cx^n)}{m+r+1}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] b*e^3*f^m*x*e^(m*log(x) + 3*r*log(x))*log(c*x^n)/(m + 3*r + 1) + 3*b*d*e^2*
f^m*x*e^(m*log(x) + 2*r*log(x))*log(c*x^n)/(m + 2*r + 1) + 3*b*d^2*e*f^m*x*
e^(m*log(x) + r*log(x))*log(c*x^n)/(m + r + 1) - b*d^3*f^m*n*x*x^m/(m + 1)^
2 + a*e^3*f^m*x*e^(m*log(x) + 3*r*log(x))/(m + 3*r + 1) - b*e^3*f^m*n*x*e^(
m*log(x) + 3*r*log(x))/(m + 3*r + 1)^2 + 3*a*d*e^2*f^m*x*e^(m*log(x) + 2*r*
log(x))/(m + 2*r + 1) - 3*b*d*e^2*f^m*n*x*e^(m*log(x) + 2*r*log(x))/(m + 2*
r + 1)^2 + 3*a*d^2*e*f^m*x*e^(m*log(x) + r*log(x))/(m + r + 1) - 3*b*d^2*e*
f^m*n*x*e^(m*log(x) + r*log(x))/(m + r + 1)^2 + (f*x)^(m + 1)*b*d^3*log(c*x
^n)/(f*(m + 1)) + (f*x)^(m + 1)*a*d^3/(f*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(f\,x\right)}^m\,{\left(d+e\,x^r\right)}^3\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d + e*x^r)^3*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^m*(d + e*x^r)^3*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.441 $\int (fx)^m (d+ex^r)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=165

$$\frac{d^2(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{2dex^{r+1}(fx)^m(a+b\log(cx^n))}{m+r+1}+\frac{e^2x^{2r+1}(fx)^m(a+b\log(cx^n))}{m+2r+1}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-2$$

```
[Out] -2*b*d*e*n*x^(1+r)*(f*x)^m/(1+m+r)^2-b*e^2*n*x^(1+2*r)*(f*x)^m/(1+m+2*r)^2-
b*d^2*n*(f*x)^(1+m)/f/(1+m)^2+2*d*e*x^(1+r)*(f*x)^m*(a+b*ln(c*x^n))/(1+m+r)
+e^2*x^(1+2*r)*(f*x)^m*(a+b*ln(c*x^n))/(1+m+2*r)+d^2*(f*x)^(1+m)*(a+b*ln(c*
x^n))/f/(1+m)
```

Rubi [A] time = 0.19, antiderivative size = 165, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {270, 20, 30, 2350, 14}

$$\frac{d^2(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{2dex^{r+1}(fx)^m(a+b\log(cx^n))}{m+r+1}+\frac{e^2x^{2r+1}(fx)^m(a+b\log(cx^n))}{m+2r+1}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-2$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (-2*b*d*e*n*x^(1 + r)*(f*x)^m)/(1 + m + r)^2 - (b*e^2*n*x^(1 + 2*r)*(f*x)^m
)/(1 + m + 2*r)^2 - (b*d^2*n*(f*x)^(1 + m))/(f*(1 + m)^2) + (2*d*e*x^(1 + r
)*(f*x)^m*(a + b*Log[c*x^n]))/(1 + m + r) + (e^2*x^(1 + 2*r)*(f*x)^m*(a + b
*Log[c*x^n]))/(1 + m + 2*r) + (d^2*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1
+ m))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
```

```
IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int (fx)^m (d+ex^r)^2 \left(a+b\log(cx^n)\right) dx = \frac{2dex^{1+r}(fx)^m \left(a+b\log(cx^n)\right)}{1+m+r} + \frac{e^2x^{1+2r}(fx)^m \left(a+b\log(cx^n)\right)}{1+m+2r} + \frac{d^2(f}{}$$

$$= \frac{2dex^{1+r}(fx)^m \left(a+b\log(cx^n)\right)}{1+m+r} + \frac{e^2x^{1+2r}(fx)^m \left(a+b\log(cx^n)\right)}{1+m+2r} + \frac{d^2(f}{}$$

$$= -\frac{bd^2n(fx)^{1+m}}{f(1+m)^2} + \frac{2dex^{1+r}(fx)^m \left(a+b\log(cx^n)\right)}{1+m+r} + \frac{e^2x^{1+2r}(fx)^m \left(a+b\right.}{1+m+2}$$

$$= -\frac{bd^2n(fx)^{1+m}}{f(1+m)^2} + \frac{2dex^{1+r}(fx)^m \left(a+b\log(cx^n)\right)}{1+m+r} + \frac{e^2x^{1+2r}(fx)^m \left(a+b\right.}{1+m+2}$$

$$= -\frac{2bdenx^{1+r}(fx)^m}{(1+m+r)^2} - \frac{be^2nx^{1+2r}(fx)^m}{(1+m+2r)^2} - \frac{bd^2n(fx)^{1+m}}{f(1+m)^2} + \frac{2dex^{1+r}(fx)^m \left(a\right.}{1+m}$$

Mathematica [A] time = 0.26, size = 124, normalized size = 0.75

$$x(fx)^m \left(\frac{d^2\left(a+b\log(cx^n)\right)}{m+1} + \frac{2dex^r\left(a+b\log(cx^n)\right)}{m+r+1} + \frac{e^2x^{2r}\left(a+b\log(cx^n)\right)}{m+2r+1} - \frac{bd^2n}{(m+1)^2} - \frac{2bdenx^r}{(m+r+1)^2} - \frac{b}{(m-}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^2*n)/(1 + m)^2) - (2*b*d*e*n*x^r)/(1 + m + r)^2 - (b*e^2*
n*x^(2*r))/(1 + m + 2*r)^2 + (d^2*(a + b*Log[c*x^n]))/(1 + m) + (2*d*e*x^r*
(a + b*Log[c*x^n]))/(1 + m + r) + (e^2*x^(2*r)*(a + b*Log[c*x^n]))/(1 + m +
 2*r))
```

fricas [B] time = 0.85, size = 1875, normalized size = 11.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] (((b*e^2*m^5 + 5*b*e^2*m^4 + 10*b*e^2*m^3 + 10*b*e^2*m^2 + 5*b*e^2*m + 2*(b
*e^2*m^2 + 2*b*e^2*m + b*e^2)*r^3 + b*e^2 + 5*(b*e^2*m^3 + 3*b*e^2*m^2 + 3*
b*e^2*m + b*e^2)*r^2 + 4*(b*e^2*m^4 + 4*b*e^2*m^3 + 6*b*e^2*m^2 + 4*b*e^2*m
 + b*e^2)*r)*x*log(c) + (2*(b*e^2*m^2 + 2*b*e^2*m + b*e^2)*n*r^3 + 5*(b*e^2
*m^3 + 3*b*e^2*m^2 + 3*b*e^2*m + b*e^2)*n*r^2 + 4*(b*e^2*m^4 + 4*b*e^2*m^3
+ 6*b*e^2*m^2 + 4*b*e^2*m + b*e^2)*n*r + (b*e^2*m^5 + 5*b*e^2*m^4 + 10*b*e^
2*m^3 + 10*b*e^2*m^2 + 5*b*e^2*m + b*e^2)*n)*x*log(x) + (a*e^2*m^5 + 5*a*e^
2*m^4 + 10*a*e^2*m^3 + 10*a*e^2*m^2 + 5*a*e^2*m + 2*(a*e^2*m^2 + 2*a*e^2*m
+ a*e^2)*r^3 + a*e^2 + (5*a*e^2*m^3 + 15*a*e^2*m^2 + 15*a*e^2*m + 5*a*e^2 -
 (b*e^2*m^2 + 2*b*e^2*m + b*e^2)*n)*r^2 - (b*e^2*m^4 + 4*b*e^2*m^3 + 6*b*e^
2*m^2 + 4*b*e^2*m + b*e^2)*n + 2*(2*a*e^2*m^4 + 8*a*e^2*m^3 + 12*a*e^2*m^2
+ 8*a*e^2*m + 2*a*e^2 - (b*e^2*m^3 + 3*b*e^2*m^2 + 3*b*e^2*m + b*e^2)*n)*r)
*x)*x^(2*r)*e^(m*log(f) + m*log(x)) + 2*((b*d*e*m^5 + 5*b*d*e*m^4 + 10*b*d*
e*m^3 + 10*b*d*e*m^2 + 5*b*d*e*m + 4*(b*d*e*m^2 + 2*b*d*e*m + b*d*e)*r^3 +
b*d*e + 8*(b*d*e*m^3 + 3*b*d*e*m^2 + 3*b*d*e*m + b*d*e)*r^2 + 5*(b*d*e*m^4
+ 4*b*d*e*m^3 + 6*b*d*e*m^2 + 4*b*d*e*m + b*d*e)*r)*x*log(c) + (4*(b*d*e*m^
2 + 2*b*d*e*m + b*d*e)*n*r^3 + 8*(b*d*e*m^3 + 3*b*d*e*m^2 + 3*b*d*e*m + b*d
```

```
*e)*n*r^2 + 5*(b*d*e*m^4 + 4*b*d*e*m^3 + 6*b*d*e*m^2 + 4*b*d*e*m + b*d*e)*n
*r + (b*d*e*m^5 + 5*b*d*e*m^4 + 10*b*d*e*m^3 + 10*b*d*e*m^2 + 5*b*d*e*m + b
*d*e)*n)*x*log(x) + (a*d*e*m^5 + 5*a*d*e*m^4 + 10*a*d*e*m^3 + 10*a*d*e*m^2
+ 5*a*d*e*m + 4*(a*d*e*m^2 + 2*a*d*e*m + a*d*e)*r^3 + a*d*e + 4*(2*a*d*e*m^
3 + 6*a*d*e*m^2 + 6*a*d*e*m + 2*a*d*e - (b*d*e*m^2 + 2*b*d*e*m + b*d*e)*n)*
r^2 - (b*d*e*m^4 + 4*b*d*e*m^3 + 6*b*d*e*m^2 + 4*b*d*e*m + b*d*e)*n + (5*a*
d*e*m^4 + 20*a*d*e*m^3 + 30*a*d*e*m^2 + 20*a*d*e*m + 5*a*d*e - 4*(b*d*e*m^3
 + 3*b*d*e*m^2 + 3*b*d*e*m + b*d*e)*n)*r)*x)*x^r*e^(m*log(f) + m*log(x)) +
((b*d^2*m^5 + 5*b*d^2*m^4 + 10*b*d^2*m^3 + 10*b*d^2*m^2 + 4*(b*d^2*m + b*d^
2)*r^4 + 5*b*d^2*m + 12*(b*d^2*m^2 + 2*b*d^2*m + b*d^2)*r^3 + b*d^2 + 13*(b
*d^2*m^3 + 3*b*d^2*m^2 + 3*b*d^2*m + b*d^2)*r^2 + 6*(b*d^2*m^4 + 4*b*d^2*m^
3 + 6*b*d^2*m^2 + 4*b*d^2*m + b*d^2)*r)*x*log(c) + (4*(b*d^2*m + b*d^2)*n*r
^4 + 12*(b*d^2*m^2 + 2*b*d^2*m + b*d^2)*n*r^3 + 13*(b*d^2*m^3 + 3*b*d^2*m^2
 + 3*b*d^2*m + b*d^2)*n*r^2 + 6*(b*d^2*m^4 + 4*b*d^2*m^3 + 6*b*d^2*m^2 + 4*
b*d^2*m + b*d^2)*n*r + (b*d^2*m^5 + 5*b*d^2*m^4 + 10*b*d^2*m^3 + 10*b*d^2*m
^2 + 5*b*d^2*m + b*d^2)*n)*x*log(x) + (a*d^2*m^5 + 5*a*d^2*m^4 + 10*a*d^2*m
^3 + 10*a*d^2*m^2 + 4*(a*d^2*m - b*d^2*n + a*d^2)*r^4 + 5*a*d^2*m + 12*(a*d
^2*m^2 + 2*a*d^2*m + a*d^2 - (b*d^2*m + b*d^2)*n)*r^3 + a*d^2 + 13*(a*d^2*m
^3 + 3*a*d^2*m^2 + 3*a*d^2*m + a*d^2 - (b*d^2*m^2 + 2*b*d^2*m + b*d^2)*n)*r
^2 - (b*d^2*m^4 + 4*b*d^2*m^3 + 6*b*d^2*m^2 + 4*b*d^2*m + b*d^2)*n + 6*(a*d
^2*m^4 + 4*a*d^2*m^3 + 6*a*d^2*m^2 + 4*a*d^2*m + a*d^2 - (b*d^2*m^3 + 3*b*d
^2*m^2 + 3*b*d^2*m + b*d^2)*n)*r)*x)*e^(m*log(f) + m*log(x)))/(m^6 + 6*m^5
+ 4*(m^2 + 2*m + 1)*r^4 + 15*m^4 + 12*(m^3 + 3*m^2 + 3*m + 1)*r^3 + 20*m^3
+ 13*(m^4 + 4*m^3 + 6*m^2 + 4*m + 1)*r^2 + 15*m^2 + 6*(m^5 + 5*m^4 + 10*m^3
 + 10*m^2 + 5*m + 1)*r + 6*m + 1)
```

giac [B] time = 0.55, size = 528, normalized size = 3.20

$$\frac{2\,bdf^{m}mnxx^{m}x^{r}e\log(x)}{m^{2}+2\,mr+r^{2}+2\,m+2\,r+1}+\frac{2\,bdf^{m}nrxx^{m}x^{r}e\log(x)}{m^{2}+2\,mr+r^{2}+2\,m+2\,r+1}+\frac{bd^{2}f^{m}mnxx^{m}\log(x)}{m^{2}+2\,m+1}+\frac{bf^{m}mnxx^{m}x^{2\,r}e^{2}}{m^{2}+4\,mr+4\,r^{2}+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 2*b*d*f^m*m*n*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + 2*b*
d*f^m*n*r*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + b*d^2*f^
m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*m*n*x*x^m*x^(2*r)*e^2*log(x)/(m^
2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) + 2*b*f^m*n*r*x*x^m*x^(2*r)*e^2*log(x)/(
m^2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) + 2*b*d*f^m*n*x*x^m*x^r*e*log(x)/(m^2
+ 2*m*r + r^2 + 2*m + 2*r + 1) - 2*b*d*f^m*n*x*x^m*x^r*e/(m^2 + 2*m*r + r^2
 + 2*m + 2*r + 1) + 2*b*d*f^m*x*x^m*x^r*e*log(c)/(m + r + 1) + b*d^2*f^m*n*
x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*n*x*x^m*x^(2*r)*e^2*log(x)/(m^2 + 4*m*
r + 4*r^2 + 2*m + 4*r + 1) - b*d^2*f^m*n*x*x^m/(m^2 + 2*m + 1) - b*f^m*n*x*
x^m*x^(2*r)*e^2/(m^2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) + 2*a*d*f^m*x*x^m*x^r
*e/(m + r + 1) + b*f^m*x*x^m*x^(2*r)*e^2*log(c)/(m + 2*r + 1) + a*f^m*x*x^m
*x^(2*r)*e^2/(m + 2*r + 1) + (f*x)^m*b*d^2*x*log(c)/(m + 1) + (f*x)^m*a*d^2
*x/(m + 1)
```

maple [C] time = 0.97, size = 8737, normalized size = 52.95

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^r+d)^2*(b*ln(c*x^n)+a),x)
```

```
[Out] result too large to display
```

maxima [A] time = 1.64, size = 240, normalized size = 1.45

$$\frac{be^{2}f^{m}xe^{\left(m\log(x)+2\,r\log(x)\right)}\log\left(cx^{n}\right)}{m+2\,r+1}+\frac{2\,bdef^{m}xe^{\left(m\log(x)+r\log(x)\right)}\log\left(cx^{n}\right)}{m+r+1}-\frac{bd^{2}f^{m}nxx^{m}}{(m+1)^{2}}+\frac{ae^{2}f^{m}xe^{\left(m\log(x)+2\,r\log(x)\right)}}{m+2\,r+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] b*e^2*f^m*x*e^(m*log(x) + 2*r*log(x))*log(c*x^n)/(m + 2*r + 1) + 2*b*d*e*f^
m*x*e^(m*log(x) + r*log(x))*log(c*x^n)/(m + r + 1) - b*d^2*f^m*n*x*x^m/(m +
 1)^2 + a*e^2*f^m*x*e^(m*log(x) + 2*r*log(x))/(m + 2*r + 1) - b*e^2*f^m*n*x
*e^(m*log(x) + 2*r*log(x))/(m + 2*r + 1)^2 + 2*a*d*e*f^m*x*e^(m*log(x) + r*
log(x))/(m + r + 1) - 2*b*d*e*f^m*n*x*e^(m*log(x) + r*log(x))/(m + r + 1)^2
 + (f*x)^(m + 1)*b*d^2*log(c*x^n)/(f*(m + 1)) + (f*x)^(m + 1)*a*d^2/(f*(m +
 1))
```

mupad [F]   time = 0.00, size = -1, normalized size = -0.01

$$\int \left(f\,x\right)^m\,{\left(d+e\,x^r\right)}^2\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d + e*x^r)^2*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^m*(d + e*x^r)^2*(a + b*log(c*x^n)), x)
```

sympy [F(-1)]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.442 $\int (fx)^m (d+ex^r) \left(a+b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=97

$$\frac{d(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{ex^{r+1}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{m+r+1}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{benx^{r+1}(fx)^m}{(m+r+1)^2}$$

```
[Out] -b*e*n*x^(1+r)*(f*x)^m/(1+m+r)^2-b*d*n*(f*x)^(1+m)/f/(1+m)^2+e*x^(1+r)*(f*x
)^m*(a+b*ln(c*x^n))/(1+m+r)+d*(f*x)^(1+m)*(a+b*ln(c*x^n))/f/(1+m)
```

Rubi [A] time = 0.10, antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {14, 20, 30, 2350}

$$\frac{d(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}+\frac{ex^{r+1}(fx)^m\left(a+b\log\left(cx^n\right)\right)}{m+r+1}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{benx^{r+1}(fx)^m}{(m+r+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*e*n*x^(1 + r)*(f*x)^m)/(1 + m + r)^2) - (b*d*n*(f*x)^(1 + m))/(f*(1 +
m)^2) + (e*x^(1 + r)*(f*x)^m*(a + b*Log[c*x^n]))/(1 + m + r) + (d*(f*x)^(1
+ m)*(a + b*Log[c*x^n]))/(f*(1 + m))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int (fx)^m (d+ex^r)\left(a+b\log(cx^n)\right)dx = \frac{ex^{1+r}(fx)^m\left(a+b\log(cx^n)\right)}{1+m+r} + \frac{d(fx)^{1+m}\left(a+b\log(cx^n)\right)}{f(1+m)} - (bn)\int (fx)$$

$$= \frac{ex^{1+r}(fx)^m\left(a+b\log(cx^n)\right)}{1+m+r} + \frac{d(fx)^{1+m}\left(a+b\log(cx^n)\right)}{f(1+m)} - (bn)\int \Big(\frac{d(f}{1}$$

$$= -\frac{bdn(fx)^{1+m}}{f(1+m)^2} + \frac{ex^{1+r}(fx)^m\left(a+b\log(cx^n)\right)}{1+m+r} + \frac{d(fx)^{1+m}\left(a+b\log(cx^n\right.}{f(1+m)}$$

$$= -\frac{bdn(fx)^{1+m}}{f(1+m)^2} + \frac{ex^{1+r}(fx)^m\left(a+b\log(cx^n)\right)}{1+m+r} + \frac{d(fx)^{1+m}\left(a+b\log(cx^n\right.}{f(1+m)}$$

$$= -\frac{benx^{1+r}(fx)^m}{(1+m+r)^2} - \frac{bdn(fx)^{1+m}}{f(1+m)^2} + \frac{ex^{1+r}(fx)^m\left(a+b\log(cx^n)\right)}{1+m+r} + \frac{d(fx)^{1+}}{}$$

Mathematica [A] time = 0.12, size = 70, normalized size = 0.72

$$x(fx)^m\left(\frac{d\left(a+b\log(cx^n)\right)}{m+1} + \frac{ex^r\left(a+b\log(cx^n)\right)}{m+r+1} - \frac{bdn}{(m+1)^2} - \frac{benx^r}{(m+r+1)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d*n)/(1 + m)^2) - (b*e*n*x^r)/(1 + m + r)^2 + (d*(a + b*Log
[c*x^n]))/(1 + m) + (e*x^r*(a + b*Log[c*x^n]))/(1 + m + r))
```

fricas [B] time = 0.88, size = 431, normalized size = 4.44

$$\frac{\left(\left(bem^3 + 3\,bem^2 + 3\,bem + be + \left(bem^2 + 2\,bem + be\right)r\right)x\log(c) + \left(\left(bem^2 + 2\,bem + be\right)nr + \left(bem^3 + 3\,bem^2 + 3\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] (((b*e*m^3 + 3*b*e*m^2 + 3*b*e*m + b*e + (b*e*m^2 + 2*b*e*m + b*e)*r)*x*log
(c) + ((b*e*m^2 + 2*b*e*m + b*e)*n*r + (b*e*m^3 + 3*b*e*m^2 + 3*b*e*m + b*e
)*n)*x*log(x) + (a*e*m^3 + 3*a*e*m^2 + 3*a*e*m + a*e - (b*e*m^2 + 2*b*e*m +
 b*e)*n + (a*e*m^2 + 2*a*e*m + a*e)*r)*x)*x^r*e^(m*log(f) + m*log(x)) + ((b
*d*m^3 + 3*b*d*m^2 + 3*b*d*m + (b*d*m + b*d)*r^2 + b*d + 2*(b*d*m^2 + 2*b*d
*m + b*d)*r)*x*log(c) + ((b*d*m + b*d)*n*r^2 + 2*(b*d*m^2 + 2*b*d*m + b*d)*
n*r + (b*d*m^3 + 3*b*d*m^2 + 3*b*d*m + b*d)*n)*x*log(x) + (a*d*m^3 + 3*a*d*
m^2 + 3*a*d*m + (a*d*m - b*d*n + a*d)*r^2 + a*d - (b*d*m^2 + 2*b*d*m + b*d)
*n + 2*(a*d*m^2 + 2*a*d*m + a*d - (b*d*m + b*d)*n)*r)*x)*e^(m*log(f) + m*lo
g(x)))/(m^4 + 4*m^3 + (m^2 + 2*m + 1)*r^2 + 6*m^2 + 2*(m^3 + 3*m^2 + 3*m +
1)*r + 4*m + 1)
```

giac [B] time = 0.52, size = 291, normalized size = 3.00

$$\frac{bf^m mnxx^m x^r e\log(x)}{m^2+2\,mr+r^2+2\,m+2\,r+1} + \frac{bf^m nrxx^m x^r e\log(x)}{m^2+2\,mr+r^2+2\,m+2\,r+1} + \frac{bdf^m mnxx^m\log(x)}{m^2+2\,m+1} + \frac{bf^m nxx^m x^r e\log(x)}{m^2+2\,mr+r^2+2\,m+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + b*f^m*n*
r*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + b*d*f^m*m*n*x*x^
```

```
m*log(x)/(m^2 + 2*m + 1) + b*f^m*n*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 +
2*m + 2*r + 1) - b*f^m*n*x*x^m*x^r*e/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) +
b*f^m*x*x^m*x^r*e*log(c)/(m + r + 1) + b*d*f^m*n*x*x^m*log(x)/(m^2 + 2*m +
1) - b*d*f^m*n*x*x^m/(m^2 + 2*m + 1) + a*f^m*x*x^m*x^r*e/(m + r + 1) + (f*x
)^m*b*d*x*log(c)/(m + 1) + (f*x)^m*a*d*x/(m + 1)
```

maple [C] time = 0.47, size = 2152, normalized size = 22.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^r+d)*(b*ln(c*x^n)+a),x)
```

```
[Out] b*x*(m*e*x^r+m*d+d*r+e*x^r+d)/(m+1)/(1+m+r)*exp(1/2*(-I*Pi*csgn(I*f)*csgn(I
*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I
*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x))*m)*ln(x^n)-1/2*x*(2*b*d*n-2*a*e*x^r-6*a*
d*m+2*I*Pi*b*e*m*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-6*a*e*m^2*x^r-2*
a*e*m^3*x^r-2*a*e*r*x^r+2*b*e*n*x^r-6*x^r*a*e*m-2*b*d*m^3*ln(c)-6*b*d*m^2*l
n(c)-6*b*d*m*ln(c)-2*a*e*m^2*r*x^r+2*b*e*m^2*n*x^r-4*a*e*m*r*x^r+4*b*e*m*n*
x^r-2*ln(c)*b*e*m^3*x^r-6*a*d*m^2-4*a*d*m^2*r-2*a*d*m*r^2-2*b*d*r^2*ln(c)-4
*b*d*r*ln(c)-2*b*e*x^r*ln(c)-4*a*d*r-2*a*d+2*b*d*n*r^2+2*b*d*m^2*n+I*Pi*b*e
*r*x^r*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-3*I*Pi*b*d*m*csgn(I*x^n)*csgn(I*
c*x^n)^2-3*I*Pi*b*d*m*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b*d*m^2*r*csgn(I*c*x
^n)^3-2*a*d*m^3-2*a*d*r^2+4*b*d*n*r-2*b*d*ln(c)-3*I*Pi*b*e*m*csgn(I*c*x^n)^
2*csgn(I*c)*x^r+I*Pi*b*d*m^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d*m
^3*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*m^3*csgn(I*c*x^n)^2*csgn(I*c)+4*b*d
*m*n-8*a*d*m*r-I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*r^2*csgn(I
*c*x^n)^2*csgn(I*c)+I*Pi*b*e*m^3*csgn(I*c*x^n)^3*x^r-3*I*Pi*b*d*m^2*csgn(I*
x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*d*m^2*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*b*d*m*
r*csgn(I*c*x^n)^3+I*Pi*b*e*m^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+4*I*
Pi*b*d*m*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi*b*d*m^2*r*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)+3*I*Pi*b*e*m^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*x^r+3*I*Pi*b*e*m*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-I*Pi*b*e*m^2*r*cs
gn(I*x^n)*csgn(I*c*x^n)^2*x^r-I*Pi*b*e*m^2*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+
I*Pi*b*d*m*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi*b*d*r*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)-2*b*e*r*x^r*ln(c)+I*Pi*b*e*r*x^r*csgn(I*c*x^n)^3+2
*I*Pi*b*d*csgn(I*c*x^n)^3*r-I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+3*I*Pi*b*d*m
^2*csgn(I*c*x^n)^3+3*I*Pi*b*d*m*csgn(I*c*x^n)^3+I*Pi*b*e*m^2*r*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)*x^r-2*I*Pi*b*e*m*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-
2*I*Pi*b*e*m*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+4*b*d*m*n*r+I*Pi*b*d*csgn(I*c*
x^n)^3+2*I*Pi*b*e*m*r*csgn(I*c*x^n)^3*x^r-3*I*Pi*b*e*m^2*csgn(I*x^n)*csgn(I
*c*x^n)^2*x^r-2*I*Pi*b*d*m^2*r*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d*m*r^2*csg
n(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*m*r^2*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b*
e*m*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-4*I*Pi*b*d*m*r*csgn(I*x^n)*csgn(I*c*x^n
)^2-4*I*Pi*b*d*m*r*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*e*r*x^r*csgn(I*x^n)*csg
n(I*c*x^n)^2+I*Pi*b*d*m*r^2*csgn(I*c*x^n)^3+3*I*Pi*b*e*m*csgn(I*c*x^n)^3*x^
r+3*I*Pi*b*e*m^2*csgn(I*c*x^n)^3*x^r-4*ln(c)*b*e*m*r*x^r-2*ln(c)*b*e*m^2*r*
x^r+I*Pi*b*d*m^3*csgn(I*c*x^n)^3+I*Pi*b*d*r^2*csgn(I*c*x^n)^3+I*Pi*b*e*csgn
(I*c*x^n)^3*x^r-I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*e*r*x^r*csgn(I*
c)*csgn(I*c*x^n)^2-2*I*Pi*b*d*r*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-I*Pi*b*e
*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-2*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*r-3
*I*Pi*b*e*m^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-I*Pi*b*e*m^3*csgn(I*x^n)*csgn(I
*c*x^n)^2*x^r-I*Pi*b*e*m^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+3*I*Pi*b*d*m*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*x^r+I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e*m^2*r*csgn(I
*c*x^n)^3*x^r+3*I*Pi*b*d*m^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b*d
*m^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-6*ln(c)*b*e*m^2*x^r-6*ln(c)*b*e*m*x^r-4*
ln(c)*b*d*m^2*r-2*ln(c)*b*d*m*r^2-8*ln(c)*b*d*m*r)/(m+1)^2/(1+m+r)^2*exp(1/
```

```
2*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*
csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x))*m)
```

maxima [A] time = 1.10, size = 137, normalized size = 1.41

$$\frac{bef^m xe^{(m\log(x)+r\log(x))}\log(cx^n)}{m+r+1}-\frac{bdf^m nxx^m}{(m+1)^2}+\frac{aef^m xe^{(m\log(x)+r\log(x))}}{m+r+1}-\frac{bef^m nxe^{(m\log(x)+r\log(x))}}{(m+r+1)^2}+\frac{(fx)^{m+1}bd\log(}{f(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] b*e*f^m*x*e^(m*log(x) + r*log(x))*log(c*x^n)/(m + r + 1) - b*d*f^m*n*x*x^m/
(m + 1)^2 + a*e*f^m*x*e^(m*log(x) + r*log(x))/(m + r + 1) - b*e*f^m*n*x*e^(
m*log(x) + r*log(x))/(m + r + 1)^2 + (f*x)^(m + 1)*b*d*log(c*x^n)/(f*(m + 1
)) + (f*x)^(m + 1)*a*d/(f*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (f\,x)^m\,(d+e\,x^r)\,(a+b\,\ln(c\,x^n))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d + e*x^r)*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^m*(d + e*x^r)*(a + b*log(c*x^n)), x)
```

sympy [A] time = 116.67, size = 6356, normalized size = 65.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise(((d + e)*Piecewise((a*log(x), Eq(b, 0)), (-(-a - b*log(c))*log(x)
, Eq(n, 0)), ((-a - b*log(c*x**n))**2/(2*b*n), True))/f, Eq(m, -1) & Eq(r,
0)), ((a*d*log(x) + a*e*x**r/r + b*d*n*log(x)**2/2 + b*d*log(c)*log(x) + b*
e*n*x**r*log(x)/r - b*e*n*x**r/r**2 + b*e*x**r*log(c)/r)/f, Eq(m, -1)), (-2
*a*d*n*r**3/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*
x**r) - 4*a*d*n*r**2/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**
r*n*r**2*x**r) - 2*a*d*n*r/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2
*f*f**r*n*r**2*x**r) + 2*a*e*n*r**4*x**r*log(x)/(2*f*f**r*n*r**4*x**r + 4*f
*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) + 4*a*e*n*r**3*x**r*log(x)/(2*f*f
**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) + 2*a*e*n*r*
*3*x**r/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r
) + 2*a*e*n*r**2*x**r*log(x)/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r +
 2*f*f**r*n*r**2*x**r) + 2*a*e*n*r**2*x**r/(2*f*f**r*n*r**4*x**r + 4*f*f**r
*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) + 2*a*e*r**4*x**r*log(c)/(2*f*f**r*n*r
**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) + 4*a*e*r**3*x**r*l
og(c)/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r)
+ 2*a*e*r**2*x**r*log(c)/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f
*f**r*n*r**2*x**r) - 2*b*d*n**2*r**3*log(x)/(2*f*f**r*n*r**4*x**r + 4*f*f**
r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) - 4*b*d*n**2*r**2*log(x)/(2*f*f**r*n*
r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) - 2*b*d*n**2*r**2/
(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) - 2*b*
d*n**2*r*log(x)/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r
**2*x**r) - 4*b*d*n**2*r/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f
*f**r*n*r**2*x**r) - 2*b*d*n**2/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**
r + 2*f*f**r*n*r**2*x**r) - 2*b*d*n*r**3*log(c)/(2*f*f**r*n*r**4*x**r + 4*f
*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) - 4*b*d*n*r**2*log(c)/(2*f*f**r*n
```

```
*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) - 2*b*d*n*r*log(c
)/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) + b*
e*n**2*r**4*x**r*log(x)**2/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2
*f*f**r*n*r**2*x**r) + 2*b*e*n**2*r**3*x**r*log(x)**2/(2*f*f**r*n*r**4*x**r
 + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) + b*e*n**2*r**2*x**r*log(x)
**2/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) -
2*b*e*n**2*r**2*x**r/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**
r*n*r**2*x**r) + 2*b*e*n*r**4*x**r*log(c)*log(x)/(2*f*f**r*n*r**4*x**r + 4*
f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) + 4*b*e*n*r**3*x**r*log(c)*log(x
)/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) + 2*
b*e*n*r**2*x**r*log(c)*log(x)/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r
+ 2*f*f**r*n*r**2*x**r) + b*e*r**4*x**r*log(c)**2/(2*f*f**r*n*r**4*x**r + 4
*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) + 2*b*e*r**3*x**r*log(c)**2/(2*
f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*r**2*x**r) + b*e*r**
2*x**r*log(c)**2/(2*f*f**r*n*r**4*x**r + 4*f*f**r*n*r**3*x**r + 2*f*f**r*n*
r**2*x**r), Eq(m, -r - 1)), (a*d*f**m*m**3*x*x**m/(m**4 + 2*m**3*r + 4*m**3
 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1)
 + 2*a*d*f**m*m**2*r*x*x**m/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*
r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 3*a*d*f**m*m**2*x*x
**m/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 +
6*m*r + 4*m + r**2 + 2*r + 1) + a*d*f**m*m*r**2*x*x**m/(m**4 + 2*m**3*r + 4
*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r
 + 1) + 4*a*d*f**m*m*r*x*x**m/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**
2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 3*a*d*f**m*m*x*x*
*m/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6
*m*r + 4*m + r**2 + 2*r + 1) + a*d*f**m*r**2*x*x**m/(m**4 + 2*m**3*r + 4*m*
*3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r +
1) + 2*a*d*f**m*r*x*x**m/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r +
 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + a*d*f**m*x*x**m/(m**4
+ 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*
m + r**2 + 2*r + 1) + a*e*f**m*m**3*x*x**m*x**r/(m**4 + 2*m**3*r + 4*m**3 +
 m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) +
 a*e*f**m*m**2*r*x*x**m*x**r/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2
*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 3*a*e*f**m*m**2*x*
x**m*x**r/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r
**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 2*a*e*f**m*m*r*x*x**m*x**r/(m**4 + 2*
m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m +
r**2 + 2*r + 1) + 3*a*e*f**m*m*x*x**m*x**r/(m**4 + 2*m**3*r + 4*m**3 + m**2
*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + a*e*
f**m*r*x*x**m*x**r/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**
2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + a*e*f**m*x*x**m*x**r/(m**4 +
 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m
 + r**2 + 2*r + 1) + b*d*f**m*m**3*n*x*x**m*log(x)/(m**4 + 2*m**3*r + 4*m**
3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1
) + b*d*f**m*m**3*x*x**m*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m
**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 2*b*d*f**m*m**2
*n*r*x*x**m*log(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**
2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 3*b*d*f**m*m**2*n*x*x**m*log
(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 +
6*m*r + 4*m + r**2 + 2*r + 1) - b*d*f**m*m**2*n*x*x**m/(m**4 + 2*m**3*r + 4
*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r
 + 1) + 2*b*d*f**m*m**2*r*x*x**m*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r*
*2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 3*b*d*f
**m*m**2*x*x**m*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6
*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + b*d*f**m*m*n*r**2*x*x**m
*log(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**
2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 4*b*d*f**m*m*n*r*x*x**m*log(x)/(m**4 +
2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m
+ r**2 + 2*r + 1) - 2*b*d*f**m*m*n*r*x*x**m/(m**4 + 2*m**3*r + 4*m**3 + m**
```

```
2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 3*b
*d*f**m*m*n*x*x**m*log(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r
+ 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) - 2*b*d*f**m*m*n*x*x**m
/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m
*r + 4*m + r**2 + 2*r + 1) + b*d*f**m*m*r**2*x*x**m*log(c)/(m**4 + 2*m**3*r
 + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 +
 2*r + 1) + 4*b*d*f**m*m*r*x*x**m*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r
**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 3*b*d*
f**m*m*x*x**m*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m
**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + b*d*f**m*n*r**2*x*x**m*log
(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 +
6*m*r + 4*m + r**2 + 2*r + 1) - b*d*f**m*n*r**2*x*x**m/(m**4 + 2*m**3*r + 4
*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r
 + 1) + 2*b*d*f**m*n*r*x*x**m*log(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2
+ 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) - 2*b*d*f**m
*n*r*x*x**m/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m
*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + b*d*f**m*n*x*x**m*log(x)/(m**4 + 2*
m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m +
r**2 + 2*r + 1) - b*d*f**m*n*x*x**m/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 +
 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + b*d*f**m*r*
*2*x*x**m*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2
+ 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 2*b*d*f**m*r*x*x**m*log(c)/(m*
*4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r +
 4*m + r**2 + 2*r + 1) + b*d*f**m*x*x**m*log(c)/(m**4 + 2*m**3*r + 4*m**3 +
 m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) +
 b*e*f**m*m**3*n*x*x**m*x**r*log(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 +
 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + b*e*f**m*m*
*3*x*x**m*x**r*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*
m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + b*e*f**m*m**2*n*r*x*x**m*
x**r*log(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m
*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 3*b*e*f**m*m**2*n*x*x**m*x**r*log(x
)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*
m*r + 4*m + r**2 + 2*r + 1) - b*e*f**m*m**2*n*x*x**m*x**r/(m**4 + 2*m**3*r
+ 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 +
2*r + 1) + b*e*f**m*m**2*r*x*x**m*x**r*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m
**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 3
*b*e*f**m*m**2*x*x**m*x**r*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6
*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 2*b*e*f**m*m*
n*r*x*x**m*x**r*log(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6
*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + 3*b*e*f**m*m*n*x*x**m*x*
*r*log(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r
**2 + 6*m*r + 4*m + r**2 + 2*r + 1) - 2*b*e*f**m*m*n*x*x**m*x**r/(m**4 + 2*
m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m +
r**2 + 2*r + 1) + 2*b*e*f**m*m*r*x*x**m*x**r*log(c)/(m**4 + 2*m**3*r + 4*m*
*3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r +
1) + 3*b*e*f**m*m*x*x**m*x**r*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2
+ 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + b*e*f**m*n
*r*x*x**m*x**r*log(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*
m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + b*e*f**m*n*x*x**m*x**r*lo
g(x)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 +
 6*m*r + 4*m + r**2 + 2*r + 1) - b*e*f**m*n*x*x**m*x**r/(m**4 + 2*m**3*r +
4*m**3 + m**2*r**2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*
r + 1) + b*e*f**m*r*x*x**m*x**r*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**
2 + 6*m**2*r + 6*m**2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1) + b*e*f**m
*x*x**m*x**r*log(c)/(m**4 + 2*m**3*r + 4*m**3 + m**2*r**2 + 6*m**2*r + 6*m*
*2 + 2*m*r**2 + 6*m*r + 4*m + r**2 + 2*r + 1), True))
```

3.443 $\int (fx)^m \left(a + b\log\left(cx^n\right)\right) dx$

Optimal. Leaf size=46

$$\frac{(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}-\frac{bn(fx)^{m+1}}{f(m+1)^2}$$

```
[Out] -b*n*(f*x)^(1+m)/f/(1+m)^2+(f*x)^(1+m)*(a+b*ln(c*x^n))/f/(1+m)
```

Rubi [A] time = 0.02, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {2304}

$$\frac{(fx)^{m+1}\left(a+b\log\left(cx^n\right)\right)}{f(m+1)}-\frac{bn(fx)^{m+1}}{f(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*(f*x)^(1 + m))/(f*(1 + m)^2)) + ((f*x)^(1 + m)*(a + b*Log[c*x^n]))/(
f*(1 + m))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int (fx)^m\left(a+b\log\left(cx^n\right)\right)dx=-\frac{bn(fx)^{1+m}}{f(1+m)^2}+\frac{(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 0.70

$$\frac{x(fx)^m\left(am+a+b(m+1)\log\left(cx^n\right)-bn\right)}{(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] (x*(f*x)^m*(a + a*m - b*n + b*(1 + m)*Log[c*x^n]))/(1 + m)^2
```

fricas [A] time = 0.97, size = 52, normalized size = 1.13

$$\frac{\left((bm+b)nx\log(x)+(bm+b)x\log(c)+(am-bn+a)x\right)e^{\left(m\log(f)+m\log(x)\right)}}{m^2+2m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((b*m + b)*n*x*log(x) + (b*m + b)*x*log(c) + (a*m - b*n + a)*x)*e^(m*log(f)
 + m*log(x))/(m^2 + 2*m + 1)
```

giac [B] time = 0.30, size = 95, normalized size = 2.07

$$\frac{bf^m mnxx^m\log(x)}{m^2+2m+1}+\frac{bf^m nxx^m\log(x)}{m^2+2m+1}-\frac{bf^m nxx^m}{m^2+2m+1}+\frac{(fx)^m bx\log(c)}{m+1}+\frac{(fx)^m ax}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*n*x*x^m*log(x)/(m^2 + 2*m +
1) - b*f^m*n*x*x^m/(m^2 + 2*m + 1) + (f*x)^m*b*x*log(c)/(m + 1) + (f*x)^m*a
*x/(m + 1)
```

maple [C] time = 0.07, size = 371, normalized size = 8.07

$$\frac{bx\,e^{\frac{\left(-i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ix)\mathrm{csgn}(ifx)+i\pi\,\mathrm{csgn}(if)\mathrm{csgn}(ifx)^2+i\pi\,\mathrm{csgn}(ix)\mathrm{csgn}(ifx)^2-i\pi\mathrm{csgn}(ifx)^3+2\ln(f)+2\ln(x)\right)m}{2}}\ln(x^n)}{m+1}-\frac{\left(i\pi bm\,\mathrm{csgn}(ic)\,\mathrm{csgn}(ix^n)\,\mathrm{c}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a),x)
```

```
[Out] b/(m+1)*x*exp(1/2*(-I*Pi*csgn(I*f)*csgn(I*x)*csgn(I*f*x)+I*Pi*csgn(I*f)*csg
n(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*Pi*csgn(I*f*x)^3+2*ln(f)+2*ln(x))
*m)*ln(x^n)-1/2*(I*Pi*b*m*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-I*Pi*b*m*csgn
(I*c)*csgn(I*c*x^n)^2-I*Pi*b*m*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*m*csgn(I*
c*x^n)^3+I*Pi*b*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)-I*Pi*b*csgn(I*c)*csgn(I
*c*x^n)^2-I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*csgn(I*c*x^n)^3-2*b*m*l
n(c)-2*a*m+2*b*n-2*b*ln(c)-2*a)/(m+1)^2*x*exp(1/2*(-I*Pi*csgn(I*f)*csgn(I*x
)*csgn(I*f*x)+I*Pi*csgn(I*f)*csgn(I*f*x)^2+I*Pi*csgn(I*x)*csgn(I*f*x)^2-I*P
i*csgn(I*f*x)^3+2*ln(f)+2*ln(x))*m)
```

maxima [A] time = 1.01, size = 57, normalized size = 1.24

$$-\frac{bf^m nxx^m}{(m+1)^2}+\frac{(fx)^{m+1}b\log(cx^n)}{f(m+1)}+\frac{(fx)^{m+1}a}{f(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -b*f^m*n*x*x^m/(m + 1)^2 + (f*x)^(m + 1)*b*log(c*x^n)/(f*(m + 1)) + (f*x)^(
m + 1)*a/(f*(m + 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int (f\,x)^m\,\left(a+b\,\ln\left(c\,x^n\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a + b*log(c*x^n)),x)
```

```
[Out] int((f*x)^m*(a + b*log(c*x^n)), x)
```

sympy [A] time = 10.37, size = 192, normalized size = 4.17

$$\begin{cases} \frac{af^m mxx^m}{m^2+2m+1} + \frac{af^m xx^m}{m^2+2m+1} + \frac{bf^m mnxx^m \log(x)}{m^2+2m+1} + \frac{bf^m mxx^m \log(c)}{m^2+2m+1} + \frac{bf^m nxx^m \log(x)}{m^2+2m+1} - \frac{bf^m nxx^m}{m^2+2m+1} + \frac{bf^m xx^m \log(c)}{m^2+2m+1} & \text{for } m \neq -1 \\ \frac{\begin{cases} a\log(x) & \text{for } b = 0 \\ -\left(-a - b\log(c)\right)\log(x) & \text{for } n = 0 \\ \frac{\left(-a-b\log(cx^n)\right)^2}{2bn} & \text{otherwise} \end{cases}}{f} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((a*f**m*m*x*x**m/(m**2 + 2*m + 1) + a*f**m*x*x**m/(m**2 + 2*m + 1
) + b*f**m*m*n*x*x**m*log(x)/(m**2 + 2*m + 1) + b*f**m*m*x*x**m*log(c)/(m**
2 + 2*m + 1) + b*f**m*n*x*x**m*log(x)/(m**2 + 2*m + 1) - b*f**m*n*x*x**m/(m
**2 + 2*m + 1) + b*f**m*x*x**m*log(c)/(m**2 + 2*m + 1), Ne(m, -1)), (Piecew
ise((a*log(x), Eq(b, 0)), (-(-a - b*log(c))*log(x), Eq(n, 0)), ((-a - b*log
(c*x**n))**2/(2*b*n), True))/f, True))
```

3.444 $\int \frac{(fx)^m(a+b\log(cx^n))}{d+ex^r}\,dx$

Optimal. Leaf size=28

$$\operatorname{Int}\left(\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^r},x\right)$$

```
[Out] Unintegrable((f*x)^m*(a+b*ln(c*x^n))/(d+e*x^r),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r),x]
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r), x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx=\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Mathematica [A] time = 0.16, size = 111, normalized size = 3.96

$$\frac{x(fx)^m\left((m+1)\left(a+b\log\left(cx^n\right)\right)\,{}_2F_1\left(1,\frac{m+1}{r};\frac{m+r+1}{r};-\frac{ex^r}{d}\right)-bn\,{}_3F_2\left(1,\frac{m}{r}+\frac{1}{r},\frac{m}{r}+\frac{1}{r};\frac{m}{r}+\frac{1}{r}+1,\frac{m}{r}+\frac{1}{r}+1;-\frac{ex^r}{d}\right)\right)}{d(m+1)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r),x]
[Out] (x*(f*x)^m*(-(b*n*HypergeometricPFQ[{1, r^(-1) + m/r, r^(-1) + m/r}, {1 + r
^(-1) + m/r, 1 + r^(-1) + m/r}, -((e*x^r)/d)]) + (1 + m)*Hypergeometric2F1[
1, (1 + m)/r, (1 + m + r)/r, -((e*x^r)/d)]*(a + b*Log[c*x^n])))/(d*(1 + m)^
2)
```

fricas [A] time = 0.79, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{\left(fx\right)^m b\log\left(cx^n\right)+\left(fx\right)^m a}{ex^r+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="fricas")
[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e*x^r + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)\left(fx\right)^m}{ex^r+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^r + d), x)
```

maple [A] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^{n})+a)\left(fx\right)^{m}}{e\,x^{r}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x^r+d),x)
[Out] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x^r+d),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)\left(fx\right)^{m}}{ex^{r}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^r + d), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(f\,x\right)^{m}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{d+e\,x^{r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x^r),x)
[Out] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x^r), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(fx\right)^{m}\left(a+b\log\left(cx^{n}\right)\right)}{d+ex^{r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))/(d+e*x**r),x)
[Out] Integral((f*x)**m*(a + b*log(c*x**n))/(d + e*x**r), x)
```

3.445 $\int \frac{(fx)^m(a+b\log(cx^n))}{(d+ex^r)^2}\,dx$

Optimal. Leaf size=28

$$\text{Int}\left(\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2},x\right)$$

```
[Out] Unintegrable((f*x)^m*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx=\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Mathematica [A] time = 0.39, size = 177, normalized size = 6.32

$$\frac{x(fx)^m\left(bn(m-r+1)\left(d+ex^r\right){}_3F_2\left(1,\frac{m}{r}+\frac{1}{r},\frac{m}{r}+\frac{1}{r};\frac{m}{r}+\frac{1}{r}+1,\frac{m}{r}+\frac{1}{r}+1;-\frac{ex^r}{d}\right)-(m+1)\left(\left(d+ex^r\right){}_2F_1\left(1,\frac{m+1}{r}\right.\right.\right.}{d^2(m+1)^2r\left(d+ex^r\right)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
[Out] (x*(f*x)^m*(b*n*(1 + m - r)*(d + e*x^r)*HypergeometricPFQ[{1, r^(-1) + m/r,
 r^(-1) + m/r}, {1 + r^(-1) + m/r, 1 + r^(-1) + m/r}, -((e*x^r)/d)] - (1 +
m)*(-(d*(1 + m)*(a + b*Log[c*x^n])) + (d + e*x^r)*Hypergeometric2F1[1, (1 +
 m)/r, (1 + m + r)/r, -((e*x^r)/d)]*(b*n + a*(1 + m - r) + b*(1 + m - r)*Lo
g[c*x^n]))))/(d^2*(1 + m)^2*r*(d + e*x^r))
```

fricas [A] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(fx\right)^m b\log\left(cx^n\right)+\left(fx\right)^m a}{e^2x^{2r}+2\,dex^r+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="fricas")
[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e^2*x^(2*r) + 2*d*e*x^r + d^2)
, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)\left(fx\right)^m}{\left(ex^r+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="giac")
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^r + d)^2, x)
```

maple [A] time = 1.26, size = 0, normalized size = 0.00

$$\int \frac{(b\ln(c\,x^{n})+a)\left(f x\right)^{m}}{\left(e\,x^{r}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x^r+d)^2,x)
[Out] int((f*x)^m*(b*ln(c*x^n)+a)/(e*x^r+d)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\log(cx^{n})+a\right)\left(fx\right)^{m}}{\left(ex^{r}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="maxima")
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^r + d)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(f\,x\right)^{m}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{\left(d+e\,x^{r}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x^r)^2,x)
[Out] int(((f*x)^m*(a + b*log(c*x^n)))/(d + e*x^r)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(fx\right)^{m}\left(a+b\log(cx^{n})\right)}{\left(d+ex^{r}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))/(d+e*x**r)**2,x)
[Out] Integral((f*x)**m*(a + b*log(c*x**n))/(d + e*x**r)**2, x)
```

3.446 $\int \left(d+ex^{-\frac{1}{1+q}}\right)^q \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=102

$$\frac{x\left(d+ex^{-\frac{1}{q+1}}\right)^{q+1}\left(a+b\log\left(cx^n\right)\right)}{d}-bnx\left(d+ex^{-\frac{1}{q+1}}\right)^q\left(\frac{ex^{-\frac{1}{q+1}}}{d}+1\right)^{-q}{}_2F_1\left(-q-1,-q-1;-q;-\frac{ex^{-\frac{1}{q+1}}}{d}\right)$$

```
[Out] -b*n*x*(d+e/(x^(1/(1+q))))^q*hypergeom([-1-q, -1-q],[-q],-e/d/(x^(1/(1+q)))
)/((1+e/d/(x^(1/(1+q))))^q)+x*(d+e/(x^(1/(1+q))))^(1+q)*(a+b*ln(c*x^n))/d
```

Rubi [A] time = 0.04, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.115, Rules used = {2314, 246, 245}

$$\frac{x\left(d+ex^{-\frac{1}{q+1}}\right)^{q+1}\left(a+b\log\left(cx^n\right)\right)}{d}-bnx\left(d+ex^{-\frac{1}{q+1}}\right)^q\left(\frac{ex^{-\frac{1}{q+1}}}{d}+1\right)^{-q}{}_2F_1\left(-q-1,-q-1;-q;-\frac{ex^{-\frac{1}{q+1}}}{d}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(d + e/x^(1 + q)^(-1))^q*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*x*(d + e/x^(1 + q)^(-1))^q*Hypergeometric2F1[-1 - q, -1 - q, -q, -(e
/(d*x^(1 + q)^(-1)))])/(1 + e/(d*x^(1 + q)^(-1)))^q) + (x*(d + e/x^(1 + q)^
(-1))^(1 + q)*(a + b*Log[c*x^n]))/d
```

Rule 245

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p*x*Hypergeometric2F
1[-p, 1/n, 1/n + 1, -((b*x^n)/a)], x] /; FreeQ[{a, b, n, p}, x] && !IGtQ[p
, 0] && !IntegerQ[1/n] && !ILtQ[Simplify[1/n + p], 0] && (IntegerQ[p] ||
GtQ[a, 0])
```

Rule 246

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^IntPart[p]*(a + b*x
^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(1 + (b*x^n)/a)^p, x], x]
 /; FreeQ[{a, b, n, p}, x] && !IGtQ[p, 0] && !IntegerQ[1/n] && !ILtQ[Sim
plify[1/n + p], 0] && !(IntegerQ[p] || GtQ[a, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rubi steps

$$\int \left(d+ex^{-\frac{1}{1+q}}\right)^q \left(a+b\log\left(cx^n\right)\right)dx = \frac{x\left(d+ex^{-\frac{1}{1+q}}\right)^{1+q}\left(a+b\log\left(cx^n\right)\right)}{d} - \frac{(bn)\int\left(d+ex^{-\frac{1}{1+q}}\right)^{1+q}dx}{d}$$

$$= \frac{x\left(d+ex^{-\frac{1}{1+q}}\right)^{1+q}\left(a+b\log\left(cx^n\right)\right)}{d} - \left(bn\left(d+ex^{-\frac{1}{1+q}}\right)^q\left(1+\frac{ex^{-\frac{1}{1+q}}}{d}\right)^{-q}\right.$$

$$= -bnx\left(d+ex^{-\frac{1}{1+q}}\right)^q\left(1+\frac{ex^{-\frac{1}{1+q}}}{d}\right)^{-q} {}_2F_1\left(-1-q,-1-q;-q;-\frac{ex^{-\frac{1}{1+q}}}{d}\right)+$$

Mathematica [A] time = 0.59, size = 143, normalized size = 1.40

$$\frac{x^{-\frac{1}{q+1}}\left(d+ex^{-\frac{1}{q+1}}\right)^q\left(\frac{dx^{\frac{1}{q+1}}}{e}+1\right)^{-q}\left(-bdn(q+1)^2x^{\frac{q+2}{q+1}}\,{}_3F_2\left(1,1,-q;2,2;-\frac{dx^{\frac{1}{q+1}}}{e}\right)+\left(dx^{\frac{q+2}{q+1}}+ex\right)\left(\frac{dx^{\frac{1}{q+1}}}{e}+1\right)^q\left(a\right.\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e/x^(1 + q)^(-1))^q*(a + b*Log[c*x^n]),x]
```

```
[Out] ((d + e/x^(1 + q)^(-1))^q*(-(b*d*n*(1 + q)^2*x^((2 + q)/(1 + q))*Hypergeome
tricPFQ[{1, 1, -q}, {2, 2}, -((d*x^(1 + q)^(-1))/e)]) - b*e*n*x*Log[x] + (1
 + (d*x^(1 + q)^(-1))/e)^q*(e*x + d*x^((2 + q)/(1 + q)))*(a + b*Log[c*x^n])
))/(d*x^(1 + q)^(-1)*(1 + (d*x^(1 + q)^(-1))/e)^q)
```

fricas [F] time = 0.83, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(b\log\left(cx^n\right)+a\right)\left(\frac{dx^{\left(\frac{1}{q+1}\right)}+e}{x^{\left(\frac{1}{q+1}\right)}}\right)^q,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e/(x^(1/(1+q))))^q*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)*((d*x^(1/(q + 1)) + e)/x^(1/(q + 1)))^q, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(b\log\left(cx^n\right)+a\right)\left(d+\frac{e}{x^{\left(\frac{1}{q+1}\right)}}\right)^q dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e/(x^(1/(1+q))))^q*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*(d + e/x^(1/(q + 1)))^q, x)
```

maple [F] time = 0.66, size = 0, normalized size = 0.00

$$\int\left(b\ln\left(cx^n\right)+a\right)\left(ex^{-\frac{1}{q+1}}+d\right)^q dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e/(x^(1/(1+q))))^q*(b*ln(c*x^n)+a),x)
```

```
[Out] int((d+e/(x^(1/(1+q))))^q*(b*ln(c*x^n)+a),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b \log \left(cx^{n}\right) + a\right)\left(d + \frac{e}{x^{\left(\frac{1}{q+1}\right)}}\right)^{q} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e/(x^(1/(1+q))))^q*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*(d + e/x^(1/(q + 1)))^q, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(d+\frac{e}{x^{\frac{1}{q+1}}}\right)}^q\,\left(a+b\,\ln\left(c\,x^n\right)\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e/x^(1/(q + 1)))^q*(a + b*log(c*x^n)),x)
```

```
[Out] int((d + e/x^(1/(q + 1)))^q*(a + b*log(c*x^n)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e/(x**(1/(1+q))))**q*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.447 $\int (fx)^{-1-(1+q)r}(d+ex^r)^q\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=119

$$-\frac{(fx)^{-((q+1)r)}(d+ex^r)^{q+1}\left(a+b\log\left(cx^n\right)\right)}{df(q+1)r}-\frac{bn(fx)^{-((q+1)r)}(d+ex^r)^q\left(\frac{ex^r}{d}+1\right)^{-q}{}_2F_1\left(-q-1,-q-1;-q;-\frac{ex^r}{d}\right)}{f(q+1)^2r^2}$$

```
[Out] -b*n*(d+e*x^r)^q*hypergeom([-1-q, -1-q],[-q],-e*x^r/d)/f/(1+q)^2/r^2/((f*x)
^((1+q)*r))/((1+e*x^r/d)^q)-(d+e*x^r)^(1+q)*(a+b*ln(c*x^n))/d/f/(1+q)/r/((f
*x)^((1+q)*r))
```

Rubi [A] time = 0.13, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2335, 365, 364}

$$-\frac{(fx)^{-(q+1)r}(d+ex^r)^{q+1}\left(a+b\log\left(cx^n\right)\right)}{df(q+1)r}-\frac{bn(fx)^{-(q+1)r}(d+ex^r)^q\left(\frac{ex^r}{d}+1\right)^{-q}{}_2F_1\left(-q-1,-q-1;-q;-\frac{ex^r}{d}\right)}{f(q+1)^2r^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 - (1 + q)*r)*(d + e*x^r)^q*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*(d + e*x^r)^q*Hypergeometric2F1[-1 - q, -1 - q, -q, -((e*x^r)/d)])/(
f*(1 + q)^2*r^2*(f*x)^((1 + q)*r)*(1 + (e*x^r)/d)^q)) - ((d + e*x^r)^(1 + q
)*(a + b*Log[c*x^n]))/(d*f*(1 + q)*r*(f*x)^((1 + q)*r))
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rubi steps

$$\int (fx)^{-1-(1+q)r}(d+ex^r)^q\left(a+b\log(cx^n)\right)dx = -\frac{(fx)^{-(1+q)r}(d+ex^r)^{1+q}\left(a+b\log(cx^n)\right)}{df(1+q)r} + \frac{(bn)\int (fx)^{-1-(1+q)r}(}{d(1+q}$$

$$= -\frac{(fx)^{-(1+q)r}(d+ex^r)^{1+q}\left(a+b\log(cx^n)\right)}{df(1+q)r} + \frac{\left(bn(d+ex^r)^q\left(1+\frac{e}{}\right.\right.}{}$$

$$= -\frac{bn(fx)^{-(1+q)r}(d+ex^r)^q\left(1+\frac{ex^r}{d}\right)^{-q}{}_2F_1\left(-1-q,-1-q;-q;-\frac{ex^r}{d}\right.}{f(1+q)^2r^2}$$

Mathematica [A] time = 0.35, size = 98, normalized size = 0.82

$$-\frac{(fx)^{-((q+1)r)}(d+ex^r)^q\left(\frac{(q+1)r(d+ex^r)\left(a+b\log(cx^n)\right)}{d}+bn\left(\frac{ex^r}{d}+1\right)^{-q}{}_2F_1\left(-q-1,-q-1;-q;-\frac{ex^r}{d}\right)\right)}{f(q+1)^2r^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 - (1 + q)*r)*(d + e*x^r)^q*(a + b*Log[c*x^n]),x]
```

```
[Out] -(((d + e*x^r)^q*((b*n*Hypergeometric2F1[-1 - q, -1 - q, -q, -((e*x^r)/d)])
/(1 + (e*x^r)/d)^q + ((1 + q)*r*(d + e*x^r)*(a + b*Log[c*x^n]))/d))/(f*(1 +
 q)^2*r^2*(f*x)^((1 + q)*r)))
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(\left(fx\right)^{-(q+1)r-1}b\log(cx^n)+\left(fx\right)^{-(q+1)r-1}a\right)(ex^r+d)^q,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1-(1+q)*r)*(d+e*x^r)^q*(a+b*log(c*x^n)),x, algorithm="fri
cas")
```

```
[Out] integral(((f*x)^(-(q + 1)*r - 1)*b*log(c*x^n) + (f*x)^(-(q + 1)*r - 1)*a)*(
e*x^r + d)^q, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b\log(cx^n)+a\right)(ex^r+d)^q\left(fx\right)^{-(q+1)r-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1-(1+q)*r)*(d+e*x^r)^q*(a+b*log(c*x^n)),x, algorithm="gia
c")
```

```
[Out] integrate((b*log(c*x^n) + a)*(e*x^r + d)^q*(f*x)^(-(q + 1)*r - 1), x)
```

maple [F] time = 0.74, size = 0, normalized size = 0.00

$$\int (b\ln(c\,x^n)+a)\left(fx\right)^{-(q+1)r-1}(e\,x^r+d)^q\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1-(1+q)*r)*(e*x^r+d)^q*(b*ln(c*x^n)+a),x)
```

```
[Out] int((f*x)^(-1-(1+q)*r)*(e*x^r+d)^q*(b*ln(c*x^n)+a),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b\log\left(cx^{n}\right)+a\right)(ex^{r}+d)^{q}\left(fx\right)^{-\left(q+1\right)r-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1-(1+q)*r)*(d+e*x^r)^q*(a+b*log(c*x^n)),x, algorithm="max
ima")
```

```
[Out] integrate((b*log(c*x^n) + a)*(e*x^r + d)^q*(f*x)^(-(q + 1)*r - 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(d+e\,x^{r})^{q}\,\left(a+b\,\ln\left(c\,x^{n}\right)\right)}{\left(f\,x\right)^{r\,\left(q+1\right)+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((d + e*x^r)^q*(a + b*log(c*x^n)))/(f*x)^(r*(q + 1) + 1),x)
```

```
[Out] int(((d + e*x^r)^q*(a + b*log(c*x^n)))/(f*x)^(r*(q + 1) + 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1-(1+q)*r)*(d+e*x**r)**q*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

3.448 $\int (fx)^m (d+ex^r)^3 (a+b\log(cx^n))^p\,dx$

Optimal. Leaf size=480

$$\frac{d^3(fx)^{m+1}e^{-\frac{a(m+1)}{bn}}(cx^n)^{-\frac{m+1}{n}}\left(a+b\log(cx^n)\right)^p\left(-\frac{(m+1)\left(a+b\log(cx^n)\right)}{bn}\right)^{-p}\Gamma\left(p+1,-\frac{(m+1)\left(a+b\log(cx^n)\right)}{bn}\right)}{f(m+1)}+\frac{3d^2ex^{r+1}(fx)^m}{}$$

```
[Out] d^3*(f*x)^(1+m)*GAMMA(1+p,-(1+m)*(a+b*ln(c*x^n))/b/n)*(a+b*ln(c*x^n))^p/exp
(a*(1+m)/b/n)/f/(1+m)/((c*x^n)^((1+m)/n))/((-(1+m)*(a+b*ln(c*x^n))/b/n)^p)+
3*d^2*e*x^(1+r)*(f*x)^m*GAMMA(1+p,-(1+m+r)*(a+b*ln(c*x^n))/b/n)*(a+b*ln(c*x
^n))^p/exp(a*(1+m+r)/b/n)/(1+m+r)/((c*x^n)^((1+m+r)/n))/((-(1+m+r)*(a+b*ln(
c*x^n))/b/n)^p)+3*d*e^2*x^(1+2*r)*(f*x)^m*GAMMA(1+p,-(1+m+2*r)*(a+b*ln(c*x^
n))/b/n)*(a+b*ln(c*x^n))^p/exp(a*(1+m+2*r)/b/n)/(1+m+2*r)/((c*x^n)^((1+m+2*
r)/n))/((-(1+m+2*r)*(a+b*ln(c*x^n))/b/n)^p)+e^3*x^(1+3*r)*(f*x)^m*GAMMA(1+p
,-(1+m+3*r)*(a+b*ln(c*x^n))/b/n)*(a+b*ln(c*x^n))^p/exp(a*(1+m+3*r)/b/n)/(1+
m+3*r)/((c*x^n)^((1+m+3*r)/n))/((-(1+m+3*r)*(a+b*ln(c*x^n))/b/n)^p)
```

Rubi [A] time = 0.66, antiderivative size = 480, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {2353, 2310, 2181, 20}

$$\frac{3d^2ex^{r+1}(fx)^m e^{-\frac{a(m+r+1)}{bn}}(cx^n)^{-\frac{m+r+1}{n}}\left(a+b\log(cx^n)\right)^p\left(-\frac{(m+r+1)\left(a+b\log(cx^n)\right)}{bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+r+1)\left(a+b\log(cx^n)\right)}{bn}\right)}{m+r+1}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)^3*(a + b*Log[c*x^n])^p,x]
```

```
[Out] (d^3*(f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a +
 b*Log[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-((
(1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + (3*d^2*e*x^(1 + r)*(f*x)^m*Gamma[1
 + p, -(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^(
(a*(1 + m + r))/(b*n))*(1 + m + r)*(c*x^n)^((1 + m + r)/n)*(-(((1 + m + r)*
(a + b*Log[c*x^n]))/(b*n)))^p) + (3*d*e^2*x^(1 + 2*r)*(f*x)^m*Gamma[1 + p,
-(((1 + m + 2*r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(
1 + m + 2*r))/(b*n))*(1 + m + 2*r)*(c*x^n)^((1 + m + 2*r)/n)*(-(((1 + m + 2
*r)*(a + b*Log[c*x^n]))/(b*n)))^p) + (e^3*x^(1 + 3*r)*(f*x)^m*Gamma[1 + p,
-(((1 + m + 3*r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(
1 + m + 3*r))/(b*n))*(1 + m + 3*r)*(c*x^n)^((1 + m + 3*r)/n)*(-(((1 + m + 3
*r)*(a + b*Log[c*x^n]))/(b*n)))^p)
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] && !I
ntegerQ[m]
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int (fx)^m (d+ex^r)^3 \left(a+b\log(cx^n)\right)^p\,dx = \int \left(d^3(fx)^m\left(a+b\log(cx^n)\right)^p + 3d^2ex^r(fx)^m\left(a+b\log(cx^n)\right)^p + 3\right.$$

$$= d^3\int (fx)^m\left(a+b\log(cx^n)\right)^p\,dx + \left(3d^2e\right)\int x^r(fx)^m\left(a+b\log(cx\right.$$

$$= \left(3d^2ex^{-m}(fx)^m\right)\int x^{m+r}\left(a+b\log(cx^n)\right)^p\,dx + \left(3de^2x^{-m}(fx)^m\right)\int$$

$$= \frac{d^3e^{-\frac{a(1+m)}{bn}}(fx)^{1+m}(cx^n)^{-\frac{1+m}{n}}\Gamma\left(1+p,-\frac{(1+m)\left(a+b\log(cx^n)\right)}{bn}\right)\left(a+b\log\right.}{f(1+m)}$$

$$= \frac{d^3e^{-\frac{a(1+m)}{bn}}(fx)^{1+m}(cx^n)^{-\frac{1+m}{n}}\Gamma\left(1+p,-\frac{(1+m)\left(a+b\log(cx^n)\right)}{bn}\right)\left(a+b\log\right.}{f(1+m)}$$

Mathematica [A] time = 1.90, size = 408, normalized size = 0.85

$$x^{-m}(fx)^m\left(a+b\log(cx^n)\right)^p\left(\frac{d^3\exp\left(-\frac{(m+1)\left(a+b\log(cx^n)-bn\log(x)\right)}{bn}\right)\left(-\frac{(m+1)\left(a+b\log(cx^n)\right)}{bn}\right)^{-p}\Gamma\left(p+1,-\frac{(m+1)\left(a+b\log(\right.}{bn}\right.}{m+1}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)^3*(a + b*Log[c*x^n])^p,x]
```

```
[Out] ((f*x)^m*(a + b*Log[c*x^n])^p*((d^3*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^
n]))/(b*n))])/(E^(((1 + m)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m)*
(-(((1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + e*((3*d^2*Gamma[1 + p, -(((1 +
 m + r)*(a + b*Log[c*x^n]))/(b*n))])/(E^(((1 + m + r)*(a - b*n*Log[x] + b*L
og[c*x^n]))/(b*n))*(1 + m + r)*(-(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n)))^
p) + e*((3*d*Gamma[1 + p, -(((1 + m + 2*r)*(a + b*Log[c*x^n]))/(b*n))])/(E^
(((1 + m + 2*r)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m + 2*r)*(-(((
1 + m + 2*r)*(a + b*Log[c*x^n]))/(b*n)))^p) + (e*Gamma[1 + p, -(((1 + m + 3
*r)*(a + b*Log[c*x^n]))/(b*n))])/(E^(((1 + m + 3*r)*(a - b*n*Log[x] + b*Log
[c*x^n]))/(b*n))*(1 + m + 3*r)*(-(((1 + m + 3*r)*(a + b*Log[c*x^n]))/(b*n))
)^p)))))/x^m
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(e^3x^{3r}+3\,de^2x^{2r}+3\,d^2ex^r+d^3\right)(fx)^m\left(b\log(cx^n)+a\right)^p,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n))^p,x, algorithm="fricas")
```

```
[Out] integral((e^3*x^(3*r) + 3*d*e^2*x^(2*r) + 3*d^2*e*x^r + d^3)*(f*x)^m*(b*log
(c*x^n) + a)^p, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex^r + d)^3 \left(fx\right)^m \left(b \log\left(cx^n\right) + a\right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n))^p,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(f*x)^m*(b*log(c*x^n) + a)^p, x)
```

maple [F] time = 1.56, size = 0, normalized size = 0.00

$$\int (e\,x^r + d)^3 \left(f x\right)^m (b \ln\left(c\,x^n\right) + a)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^r+d)^3*(b*ln(c*x^n)+a)^p,x)
```

```
[Out] int((f*x)^m*(e*x^r+d)^3*(b*ln(c*x^n)+a)^p,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n))^p,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: In function CAR, the value of t
he first argument is  0which is not of the expected type LIST
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(f\,x\right)}^m\,{\left(d+e\,x^r\right)}^3\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^p \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d + e*x^r)^3*(a + b*log(c*x^n))^p,x)
```

```
[Out] int((f*x)^m*(d + e*x^r)^3*(a + b*log(c*x^n))^p, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(d+e*x**r)**3*(a+b*ln(c*x**n))**p,x)
```

```
[Out] Timed out
```

3.449 $\int (fx)^m (d+ex^r)^2 \left(a+b\log\left(cx^n\right)\right)^p\,dx$

Optimal. Leaf size=350

$$\frac{d^2(fx)^{m+1}e^{-\frac{a(m+1)}{bn}}\left(cx^n\right)^{-\frac{m+1}{n}}\left(a+b\log\left(cx^n\right)\right)^p\left(-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)^{-p}\Gamma\left(p+1,-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)}{f(m+1)}+\frac{2dex^{r+1}(fx}{}$$

```
[Out] d^2*(f*x)^(1+m)*GAMMA(1+p,-(1+m)*(a+b*ln(c*x^n))/b/n)*(a+b*ln(c*x^n))^p/exp
(a*(1+m)/b/n)/f/(1+m)/((c*x^n)^((1+m)/n))/((-(1+m)*(a+b*ln(c*x^n))/b/n)^p)+
2*d*e*x^(1+r)*(f*x)^m*GAMMA(1+p,-(1+m+r)*(a+b*ln(c*x^n))/b/n)*(a+b*ln(c*x^n
))^p/exp(a*(1+m+r)/b/n)/(1+m+r)/((c*x^n)^((1+m+r)/n))/((-(1+m+r)*(a+b*ln(c*
x^n))/b/n)^p)+e^2*x^(1+2*r)*(f*x)^m*GAMMA(1+p,-(1+m+2*r)*(a+b*ln(c*x^n))/b/
n)*(a+b*ln(c*x^n))^p/exp(a*(1+m+2*r)/b/n)/(1+m+2*r)/((c*x^n)^((1+m+2*r)/n))
/((-(1+m+2*r)*(a+b*ln(c*x^n))/b/n)^p)
```

Rubi [A] time = 0.41, antiderivative size = 350, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$, Rules used = {2353, 2310, 2181, 20}

$$\frac{d^2(fx)^{m+1}e^{-\frac{a(m+1)}{bn}}\left(cx^n\right)^{-\frac{m+1}{n}}\left(a+b\log\left(cx^n\right)\right)^p\left(-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)}{f(m+1)}+\frac{2de}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)^2*(a + b*Log[c*x^n])^p,x]
```

```
[Out] (d^2*(f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a +
 b*Log[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-((
(1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + (2*d*e*x^(1 + r)*(f*x)^m*Gamma[1 +
 p, -(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a
*(1 + m + r))/(b*n))*(1 + m + r)*(c*x^n)^((1 + m + r)/n)*(-(((1 + m + r)*(a
 + b*Log[c*x^n]))/(b*n)))^p) + (e^2*x^(1 + 2*r)*(f*x)^m*Gamma[1 + p, -(((1
+ m + 2*r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(1 + m
+ 2*r))/(b*n))*(1 + m + 2*r)*(c*x^n)^((1 + m + 2*r)/n)*(-(((1 + m + 2*r)*(a
 + b*Log[c*x^n]))/(b*n)))^p)
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] && !I
ntegerQ[m]
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int (fx)^m (d+ex^r)^2 \left(a+b\log(cx^n)\right)^p dx = \int \left(d^2(fx)^m \left(a+b\log(cx^n)\right)^p + 2dex^r(fx)^m \left(a+b\log(cx^n)\right)^p + e^2x^{2r}\right.$$

$$= d^2 \int (fx)^m \left(a+b\log(cx^n)\right)^p dx + (2de)\int x^r(fx)^m \left(a+b\log(cx^n)\right)^p$$

$$= \left(2dex^{-m}(fx)^m\right)\int x^{m+r}\left(a+b\log(cx^n)\right)^p dx + \left(e^2x^{-m}(fx)^m\right)\int x^{m+2r}$$

$$= \frac{d^2 e^{-\frac{a(1+m)}{bn}}(fx)^{1+m}(cx^n)^{-\frac{1+m}{n}}\Gamma\left(1+p,-\frac{(1+m)\left(a+b\log(cx^n)\right)}{bn}\right)\left(a+b\log(cx\right.}{f(1+m)}$$

$$= \frac{d^2 e^{-\frac{a(1+m)}{bn}}(fx)^{1+m}(cx^n)^{-\frac{1+m}{n}}\Gamma\left(1+p,-\frac{(1+m)\left(a+b\log(cx^n)\right)}{bn}\right)\left(a+b\log(cx\right.}{f(1+m)}$$

Mathematica [A] time = 0.97, size = 304, normalized size = 0.87

$$x^{-m}(fx)^m\left(a+b\log(cx^n)\right)^p\left(\frac{d^2\exp\left(-\frac{(m+1)\left(a+b\log(cx^n)-bn\log(x)\right)}{bn}\right)\left(-\frac{(m+1)\left(a+b\log(cx^n)\right)}{bn}\right)^{-p}\Gamma\left(p+1,-\frac{(m+1)\left(a+b\log(cx^n\right)}{bn}\right.}{m+1}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)^2*(a + b*Log[c*x^n])^p,x]
```

```
[Out] ((f*x)^m*(a + b*Log[c*x^n])^p*((d^2*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^
n]))/(b*n))]])/(E^(((1 + m)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m)*
(-(((1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + e*((2*d*Gamma[1 + p, -(((1 + m
 + r)*(a + b*Log[c*x^n]))/(b*n))]])/(E^(((1 + m + r)*(a - b*n*Log[x] + b*Log
[c*x^n]))/(b*n))*(1 + m + r)*(-(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n)))^p)
 + (e*Gamma[1 + p, -(((1 + m + 2*r)*(a + b*Log[c*x^n]))/(b*n))]])/(E^(((1 +
m + 2*r)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m + 2*r)*(-(((1 + m +
 2*r)*(a + b*Log[c*x^n]))/(b*n)))^p))))/x^m
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\left(e^2x^{2r} + 2\,dex^r + d^2\right)\left(fx\right)^m\left(b\log(cx^n) + a\right)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n))^p,x, algorithm="fricas")
```

```
[Out] integral((e^2*x^(2*r) + 2*d*e*x^r + d^2)*(f*x)^m*(b*log(c*x^n) + a)^p, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex^r + d)^2 \left(fx\right)^m \left(b\log(cx^n) + a\right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n))^p,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(f*x)^m*(b*log(c*x^n) + a)^p, x)
```

maple [F] time = 1.32, size = 0, normalized size = 0.00

$$\int \left(e\,x^{r}+d\right)^{2} \left(f x\right)^{m} \left(b\ln \left(c\,x^{n}\right)+a\right)^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^r+d)^2*(b*ln(c*x^n)+a)^p,x)
```

```
[Out] int((f*x)^m*(e*x^r+d)^2*(b*ln(c*x^n)+a)^p,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n))^p,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: In function CAR, the value of t
he first argument is  0which is not of the expected type LIST
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(f\,x\right)}^m\,{\left(d+e\,x^r\right)}^2\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^p \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d + e*x^r)^2*(a + b*log(c*x^n))^p,x)
```

```
[Out] int((f*x)^m*(d + e*x^r)^2*(a + b*log(c*x^n))^p, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(d+e*x**r)**2*(a+b*ln(c*x**n))**p,x)
```

```
[Out] Timed out
```

3.450 $\int (fx)^m (d+ex^r) \left(a+b\log\left(cx^n\right)\right)^p\,dx$

Optimal. Leaf size=220

$$\frac{d(fx)^{m+1}e^{-\frac{a(m+1)}{bn}}\left(cx^n\right)^{-\frac{m+1}{n}}\left(a+b\log\left(cx^n\right)\right)^p\left(-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)^{-p}\Gamma\left(p+1,-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)}{f(m+1)}+\frac{ex^{r+1}(fx)^m e^{-\frac{a(r}{}}}{}$$

```
[Out] d*(f*x)^(1+m)*GAMMA(1+p,-(1+m)*(a+b*ln(c*x^n))/b/n)*(a+b*ln(c*x^n))^p/exp(a
*(1+m)/b/n)/f/(1+m)/((c*x^n)^((1+m)/n))/((-(1+m)*(a+b*ln(c*x^n))/b/n)^p)+e*
x^(1+r)*(f*x)^m*GAMMA(1+p,-(1+m+r)*(a+b*ln(c*x^n))/b/n)*(a+b*ln(c*x^n))^p/e
xp(a*(1+m+r)/b/n)/(1+m+r)/((c*x^n)^((1+m+r)/n))/((-(1+m+r)*(a+b*ln(c*x^n))/
b/n)^p)
```

Rubi [A] time = 0.26, antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2353, 2310, 2181, 20}

$$\frac{d(fx)^{m+1}e^{-\frac{a(m+1)}{bn}}\left(cx^n\right)^{-\frac{m+1}{n}}\left(a+b\log\left(cx^n\right)\right)^p\left(-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)}{f(m+1)}+\frac{ex^{r+1}(f}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)*(a + b*Log[c*x^n])^p,x]
```

```
[Out] (d*(f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a + b
*Log[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-(((1
 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + (e*x^(1 + r)*(f*x)^m*Gamma[1 + p, -(
((1 + m + r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(1 +
m + r))/(b*n))*(1 + m + r)*(c*x^n)^((1 + m + r)/n)*(-(((1 + m + r)*(a + b*L
og[c*x^n]))/(b*n)))^p)
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] && !I
ntegerQ[m]
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
```

```
] && IntegerQ[m] && IntegerQ[r]))
```

Rubi steps

$$\int (fx)^m (d+ex^r)\left(a+b\log(cx^n)\right)^p\,dx = \int \left(d(fx)^m\left(a+b\log(cx^n)\right)^p + ex^r(fx)^m\left(a+b\log(cx^n)\right)^p\right)dx$$
$$= d\int (fx)^m\left(a+b\log(cx^n)\right)^p\,dx + e\int x^r(fx)^m\left(a+b\log(cx^n)\right)^p\,dx$$
$$= \left(ex^{-m}(fx)^m\right)\int x^{m+r}\left(a+b\log(cx^n)\right)^p\,dx + \frac{\left(d(fx)^{1+m}(cx^n)^{-\frac{1+m}{n}}\right)\mathrm{S}}{}$$
$$= \frac{de^{-\frac{a(1+m)}{bn}}(fx)^{1+m}(cx^n)^{-\frac{1+m}{n}}\Gamma\left(1+p,-\frac{(1+m)\left(a+b\log(cx^n)\right)}{bn}\right)\left(a+b\log(c\right.}{f(1+m)}$$
$$= \frac{de^{-\frac{a(1+m)}{bn}}(fx)^{1+m}(cx^n)^{-\frac{1+m}{n}}\Gamma\left(1+p,-\frac{(1+m)\left(a+b\log(cx^n)\right)}{bn}\right)\left(a+b\log(c\right.}{f(1+m)}$$

Mathematica [A] time = 0.46, size = 200, normalized size = 0.91

$$x^{-m}(fx)^m\left(a+b\log(cx^n)\right)^p\left(\frac{d\exp\left(-\frac{(m+1)\left(a+b\log(cx^n)-bn\log(x)\right)}{bn}\right)\left(-\frac{(m+1)\left(a+b\log(cx^n)\right)}{bn}\right)^{-p}\Gamma\left(p+1,-\frac{(m+1)\left(a+b\log(c\right.}{bn}\right.}{m+1}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)*(a + b*Log[c*x^n])^p,x]
```

```
[Out] ((f*x)^m*(a + b*Log[c*x^n])^p*((d*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]
))/(b*n))])/(E^(((1 + m)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m)*(-
(((1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + (e*Gamma[1 + p, -(((1 + m + r)*(
a + b*Log[c*x^n]))/(b*n))])/(E^(((1 + m + r)*(a - b*n*Log[x] + b*Log[c*x^n]
))/(b*n))*(1 + m + r)*(-(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n)))^p)))/x^m
```

fricas [F] time = 0.88, size = 0, normalized size = 0.00

$$\mathrm{integral}\left((ex^r+d)\left(fx\right)^m\left(b\log(cx^n)+a\right)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n))^p,x, algorithm="fricas")
```

```
[Out] integral((e*x^r + d)*(f*x)^m*(b*log(c*x^n) + a)^p, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex^r+d)\left(fx\right)^m\left(b\log(cx^n)+a\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n))^p,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)*(f*x)^m*(b*log(c*x^n) + a)^p, x)
```

maple [F] time = 1.62, size = 0, normalized size = 0.00

$$\int (e\,x^{r}+d)\left(f x\right)^{m} (b\ln (c\,x^{n})+a)^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^r+d)*(b*ln(c*x^n)+a)^p,x)
```

```
[Out] int((f*x)^m*(e*x^r+d)*(b*ln(c*x^n)+a)^p,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n))^p,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: In function CAR, the value of t
he first argument is  0which is not of the expected type LIST
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(f\,x\right)}^m\,\left(d+e\,x^r\right)\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^p \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d + e*x^r)*(a + b*log(c*x^n))^p,x)
```

```
[Out] int((f*x)^m*(d + e*x^r)*(a + b*log(c*x^n))^p, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(d+e*x**r)*(a+b*ln(c*x**n))**p,x)
```

```
[Out] Timed out
```

3.451 $\int (fx)^m \left(a+b\log\left(cx^n\right)\right)^p\,dx$

Optimal. Leaf size=106

$$\frac{(fx)^{m+1}e^{-\frac{a(m+1)}{bn}}\left(cx^n\right)^{-\frac{m+1}{n}}\left(a+b\log\left(cx^n\right)\right)^p\left(-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)^{-p}\Gamma\left(p+1,-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)}{f(m+1)}$$

```
[Out] (f*x)^(1+m)*GAMMA(1+p,-(1+m)*(a+b*ln(c*x^n))/b/n)*(a+b*ln(c*x^n))^p/exp(a*(
1+m)/b/n)/f/(1+m)/((c*x^n)^((1+m)/n))/((-(1+m)*(a+b*ln(c*x^n))/b/n)^p)
```

Rubi [A] time = 0.07, antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2310, 2181}

$$\frac{(fx)^{m+1}e^{-\frac{a(m+1)}{bn}}\left(cx^n\right)^{-\frac{m+1}{n}}\left(a+b\log\left(cx^n\right)\right)^p\left(-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)}{f(m+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(a + b*Log[c*x^n])^p,x]
```

```
[Out] ((f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*L
og[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-(((1 +
 m)*(a + b*Log[c*x^n]))/(b*n)))^p)
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] && !I
ntegerQ[m]
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int (fx)^m\left(a+b\log\left(cx^n\right)\right)^p\,dx &= \frac{\left((fx)^{1+m}\left(cx^n\right)^{-\frac{1+m}{n}}\right)\text{Subst}\left(\int e^{\frac{(1+m)x}{n}}(a+bx)^p\,dx,x,\log\left(cx^n\right)\right)}{fn}\\ &= \frac{e^{-\frac{a(1+m)}{bn}}(fx)^{1+m}\left(cx^n\right)^{-\frac{1+m}{n}}\Gamma\left(1+p,-\frac{(1+m)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)\left(a+b\log\left(cx^n\right)\right)^p\left(-\frac{(1-}{}\right.}{f(1+m)}\end{aligned}$$

Mathematica [A] time = 0.07, size = 107, normalized size = 1.01

$$\frac{x^{-m}(fx)^m\left(a+b\log\left(cx^n\right)\right)^p\exp\left(-\frac{(m+1)\left(a+b\log\left(cx^n\right)-bn\log(x)\right)}{bn}\right)\left(-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right)^{-p}\Gamma\left(p+1,-\frac{(m+1)\left(a+b\log\left(cx^n\right)\right)}{bn}\right.}{m+1}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(a + b*Log[c*x^n])^p,x]
```

```
[Out] ((f*x)^m*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x
^n])^p)/(E^(((1 + m)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m)*x^m*(-
(((1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p)
```

fricas [F] time = 0.72, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(fx\right)^{m}\left(b\log\left(cx^{n}\right)+a\right)^{p},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p,x, algorithm="fricas")
```

```
[Out] integral((f*x)^m*(b*log(c*x^n) + a)^p, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(fx\right)^{m}\left(b\log\left(cx^{n}\right)+a\right)^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p,x, algorithm="giac")
```

```
[Out] integrate((f*x)^m*(b*log(c*x^n) + a)^p, x)
```

maple [F] time = 1.68, size = 0, normalized size = 0.00

$$\int\left(fx\right)^{m}\left(b\ln\left(c\,x^{n}\right)+a\right)^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a)^p,x)
```

```
[Out] int((f*x)^m*(b*ln(c*x^n)+a)^p,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: In function CAR, the value of t
he first argument is  0which is not of the expected type LIST
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int{\left(f\,x\right)}^m\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a + b*log(c*x^n))^p,x)
```

```
[Out] int((f*x)^m*(a + b*log(c*x^n))^p, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(fx\right)^{m}\left(a+b\log\left(cx^{n}\right)\right)^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))**p,x)
```

```
[Out] Integral((f*x)**m*(a + b*log(c*x**n))**p, x)
```

3.452 $\int \frac{(fx)^m\left(a+b\log(cx^n)\right)^p}{d+ex^r}\,dx$

Optimal. Leaf size=30

$$\text{Int}\left(\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^p}{d+ex^r},x\right)$$

```
[Out] Unintegrable((f*x)^m*(a+b*ln(c*x^n))^p/(d+e*x^r),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^p}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r),x]
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r), x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^p}{d+ex^r}\,dx=\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^p}{d+ex^r}\,dx$$

Mathematica [A] time = 3.07, size = 0, normalized size = 0.00

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^p}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r),x]
[Out] Integrate[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r), x]
```

fricas [A] time = 0.80, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(fx\right)^m\left(b\log\left(cx^n\right)+a\right)^p}{ex^r+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r),x, algorithm="fricas")
[Out] integral((f*x)^m*(b*log(c*x^n) + a)^p/(e*x^r + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(fx\right)^m\left(b\log\left(cx^n\right)+a\right)^p}{ex^r+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((f*x)^m*(b*log(c*x^n) + a)^p/(e*x^r + d), x)
```

maple [A] time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{(fx)^m (b\ln(c x^n) + a)^p}{e x^r + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a)^p/(e*x^r+d),x)
[Out] int((f*x)^m*(b*ln(c*x^n)+a)^p/(e*x^r+d),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: In function CAR, the value of t
he first argument is  0which is not of the expected type LIST
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{(f\,x)^m\,(a+b\,\ln(c\,x^n))^p}{d+e\,x^r}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^m*(a + b*log(c*x^n))^p)/(d + e*x^r),x)
[Out] int(((f*x)^m*(a + b*log(c*x^n))^p)/(d + e*x^r), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))**p/(d+e*x**r),x)
[Out] Timed out
```

3.453 $\int \frac{(fx)^m\left(a+b\log(cx^n)\right)^p}{(d+ex^r)^2}\,dx$

Optimal. Leaf size=30

$$\text{Int}\left(\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^p}{\left(d+ex^r\right)^2},x\right)$$

[Out] Unintegrable((f*x)^m*(a+b*ln(c*x^n))^p/(d+e*x^r)^2,x)

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^p}{\left(d+ex^r\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r)^2,x]

[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r)^2, x]

Rubi steps

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^p}{\left(d+ex^r\right)^2}\,dx=\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^p}{\left(d+ex^r\right)^2}\,dx$$

Mathematica [A] time = 3.25, size = 0, normalized size = 0.00

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)^p}{\left(d+ex^r\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r)^2,x]

[Out] Integrate[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r)^2, x]

fricas [A] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(fx\right)^m\left(b\log\left(cx^n\right)+a\right)^p}{e^2x^{2\,r}+2\,dex^r+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r)^2,x, algorithm="fricas")

[Out] integral((f*x)^m*(b*log(c*x^n) + a)^p/(e^2*x^(2*r) + 2*d*e*x^r + d^2), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(fx\right)^m\left(b\log\left(cx^n\right)+a\right)^p}{\left(ex^r+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r)^2,x, algorithm="giac")

```
[Out] integrate((f*x)^m*(b*log(c*x^n) + a)^p/(e*x^r + d)^2, x)
```

maple [A] time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{\left(fx\right)^{m} \left(b \ln \left(c\,x^{n}\right)+a\right)^{p}}{\left(e\,x^{r}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(b*ln(c*x^n)+a)^p/(e*x^r+d)^2,x)
```

```
[Out] int((f*x)^m*(b*ln(c*x^n)+a)^p/(e*x^r+d)^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: In function CAR, the value of t
he first argument is  0which is not of the expected type LIST
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(f\,x\right)}^m\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^p}{{\left(d+e\,x^r\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f*x)^m*(a + b*log(c*x^n))^p)/(d + e*x^r)^2,x)
```

```
[Out] int(((f*x)^m*(a + b*log(c*x^n))^p)/(d + e*x^r)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))**p/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

3.454 $\int \frac{(f+gx)(a+b\log(cx^n))}{(d+ex)^3}\,dx$

Optimal. Leaf size=115

$$-\frac{(f+gx)^2\left(a+b\log\left(cx^n\right)\right)}{2(d+ex)^2(ef-dg)}-\frac{bn(dg+ef)\log(d+ex)}{2d^2e^2}+\frac{bf^2n\log(x)}{2d^2(ef-dg)}+\frac{bn(ef-dg)}{2de^2(d+ex)}$$

```
[Out] 1/2*b*(-d*g+e*f)*n/d/e^2/(e*x+d)+1/2*b*f^2*n*ln(x)/d^2/(-d*g+e*f)-1/2*(g*x+
f)^2*(a+b*ln(c*x^n))/(-d*g+e*f)/(e*x+d)^2-1/2*b*(d*g+e*f)*n*ln(e*x+d)/d^2/e
^2
```

Rubi [A] time = 0.15, antiderivative size = 151, normalized size of antiderivative = 1.31, number of steps used = 7, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {2357, 2319, 44, 2314, 31}

$$-\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)}{2e^2(d+ex)^2}+\frac{gx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)}+\frac{bn\log(x)(ef-dg)}{2d^2e^2}-\frac{bn(ef-dg)\log(d+ex)}{2d^2e^2}+\frac{bn(ef-dg)}{2de^2(d+ex)}-b$$

Antiderivative was successfully verified.

```
[In] Int[((f + g*x)*(a + b*Log[c*x^n]))/(d + e*x)^3,x]
```

```
[Out] (b*(e*f - d*g)*n)/(2*d*e^2*(d + e*x)) + (b*(e*f - d*g)*n*Log[x])/(2*d^2*e^2
) - ((e*f - d*g)*(a + b*Log[c*x^n]))/(2*e^2*(d + e*x)^2) + (g*x*(a + b*Log[
c*x^n]))/(d*e*(d + e*x)) - (b*g*n*Log[d + e*x])/(d*e^2) - (b*(e*f - d*g)*n*
Log[d + e*x])/(2*d^2*e^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2357

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] :> With[{
u = ExpandIntegrand[(a + b*Log[c*x^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /
```

```
; FreeQ[{a, b, c, n}, x] && RationalFunctionQ[RFx, x] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{(f+gx)\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^3}\,dx=\int\left(\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)^3}+\frac{g\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)^2}\right)dx$$
$$=\frac{g\int\frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e}+\frac{(ef-dg)\int\frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{e}$$
$$=-\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)}{2e^2(d+ex)^2}+\frac{gx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)}-\frac{(bgn)\int\frac{1}{d+ex}\,dx}{de}+\frac{(b(\ldots$$
$$=-\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)}{2e^2(d+ex)^2}+\frac{gx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)}-\frac{bgn\log(d+ex)}{de^2}+\frac{(b(\ldots$$
$$=\frac{b(ef-dg)n}{2de^2(d+ex)}+\frac{b(ef-dg)n\log(x)}{2d^2e^2}-\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)}{2e^2(d+ex)^2}+\frac{gx\left(a+b\ldots\right.}{de(\ldots}$$

Mathematica [A] time = 0.18, size = 108, normalized size = 0.94

$$\frac{-\frac{(ef-dg)\left(a+b\log(cx^n)\right)}{(d+ex)^2}-\frac{2g\left(a+b\log(cx^n)\right)}{d+ex}+\frac{bn(ef-dg)\left(\frac{d}{d+ex}-\log(d+ex)+\log(x)\right)}{d^2}+\frac{2bgn(\log(x)-\log(d+ex))}{d}}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f + g*x)*(a + b*Log[c*x^n]))/(d + e*x)^3,x]
```

```
[Out] (-(((e*f - d*g)*(a + b*Log[c*x^n]))/(d + e*x)^2) - (2*g*(a + b*Log[c*x^n]))
/(d + e*x) + (2*b*g*n*(Log[x] - Log[d + e*x]))/d + (b*(e*f - d*g)*n*(d/(d +
 e*x) + Log[x] - Log[d + e*x]))/d^2)/(2*e^2)
```

fricas [B] time = 0.85, size = 215, normalized size = 1.87

$$-\frac{ad^2ef+ad^3g-\left(bd^2ef-bd^3g\right)n+\left(2\,ad^2eg-\left(bde^2f-bd^2eg\right)n\right)x+\left(\left(be^3f+bde^2g\right)nx^2+2\left(bde^2f+bd^2eg\ldots\right.\right.}{2\left(d^2e^4x^2\ldots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(a*d^2*e*f + a*d^3*g - (b*d^2*e*f - b*d^3*g)*n + (2*a*d^2*e*g - (b*d*e
^2*f - b*d^2*e*g)*n)*x + ((b*e^3*f + b*d*e^2*g)*n*x^2 + 2*(b*d*e^2*f + b*d^
2*e*g)*n*x + (b*d^2*e*f + b*d^3*g)*n)*log(e*x + d) + (2*b*d^2*e*g*x + b*d^2
*e*f + b*d^3*g)*log(c) - (2*b*d*e^2*f*n*x + (b*e^3*f + b*d*e^2*g)*n*x^2)*lo
g(x))/(d^2*e^4*x^2 + 2*d^3*e^3*x + d^4*e^2)
```

giac [B] time = 0.36, size = 252, normalized size = 2.19

$$-\frac{bdgnx^2e^2\log\left(xe+d\right)+2\,bd^2gnxe\log\left(xe+d\right)-bdgnx^2e^2\log(x)+bd^2gnxe+bd^3gn\log\left(xe+d\right)+bfnx^2e^3\ldots}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] -1/2*(b*d*g*n*x^2*e^2*log(x*e + d) + 2*b*d^2*g*n*x*e*log(x*e + d) - b*d*g*n
*x^2*e^2*log(x) + b*d^2*g*n*x*e + b*d^3*g*n*log(x*e + d) + b*f*n*x^2*e^3*lo
g(x*e + d) + 2*b*d*f*n*x*e^2*log(x*e + d) + b*d^2*f*n*e*log(x*e + d) + 2*b*
d^2*g*x*e*log(c) - b*f*n*x^2*e^3*log(x) - 2*b*d*f*n*x*e^2*log(x) + b*d^3*g*
n - b*d*f*n*x*e^2 - b*d^2*f*n*e + 2*a*d^2*g*x*e + b*d^3*g*log(c) + b*d^2*f*
e*log(c) + a*d^3*g + a*d^2*f*e)/(d^2*x^2*e^4 + 2*d^3*x*e^3 + d^4*e^2)
```

maple [C] time = 0.32, size = 624, normalized size = 5.43

$$-\frac{\left(2gxe+dg+ef\right)b\ln\left(x^{n}\right)}{2\left(ex+d\right)^{2}e^{2}}+\frac{2i\pi b\,d^{2}egx\,\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(ic\,x^{n}\right)-2b\,d^{3}g\ln(c)-2b\,d^{3}gn-2a\,d^{2}ef-2a\,d}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(b*ln(c*x^n)+a)/(e*x+d)^3,x)
```

```
[Out] -1/2*b*(2*e*g*x+d*g+e*f)/(e*x+d)^2/e^2*ln(x^n)+1/4*(-2*ln(c)*b*d^3*g-2*b*d^
3*g*n-2*a*d^2*e*f-2*a*d^3*g+I*Pi*b*d^3*g*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)-I*Pi*b*d^2*e*f*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d^2*e*f*csgn(I*c*x^n)^2
*csgn(I*c)+2*I*Pi*b*d^2*e*g*x*csgn(I*c*x^n)^3+2*I*Pi*b*d^2*e*g*x*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)+2*ln(-x)*b*d*e^2*g*n*x^2+4*ln(-x)*b*d^2*e*g*n*x+4
*ln(-x)*b*d*e^2*f*n*x-2*ln(e*x+d)*b*d*e^2*g*n*x^2-4*ln(e*x+d)*b*d^2*e*g*n*x
-4*ln(e*x+d)*b*d*e^2*f*n*x-I*Pi*b*d^3*g*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*
b*d^2*e*g*x*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*d^2*e*g*x*csgn(I*c*x^n)^2*
csgn(I*c)+I*Pi*b*d^2*e*f*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*b*d^2*e*g*n*
x+2*b*d*e^2*f*n*x+2*ln(-x)*b*d^3*g*n-2*ln(e*x+d)*b*d^3*g*n-2*ln(c)*b*d^2*e*
f-4*a*d^2*e*g*x+2*b*d^2*e*f*n+2*ln(-x)*b*e^3*f*n*x^2+2*ln(-x)*b*d^2*e*f*n-2
*ln(e*x+d)*b*e^3*f*n*x^2-2*ln(e*x+d)*b*d^2*e*f*n-4*ln(c)*b*d^2*e*g*x-I*Pi*b
*d^3*g*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d^3*g*csgn(I*c*x^n)^3+I*Pi*b*d^2*e*
f*csgn(I*c*x^n)^3)/d^2/e^2/(e*x+d)^2
```

maxima [B] time = 1.12, size = 218, normalized size = 1.90

$$\frac{1}{2}bfn\left(\frac{1}{de^{2}x+d^{2}e}-\frac{\log\left(ex+d\right)}{d^{2}e}+\frac{\log(x)}{d^{2}e}\right)-\frac{1}{2}bgn\left(\frac{1}{e^{3}x+de^{2}}+\frac{\log\left(ex+d\right)}{de^{2}}-\frac{\log(x)}{de^{2}}\right)-\frac{(2\,ex+d)bg\log\left(cx^{n}\right)}{2\left(e^{4}x^{2}+2\,de^{3}x+d^{2}e^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] 1/2*b*f*n*(1/(d*e^2*x + d^2*e) - log(e*x + d)/(d^2*e) + log(x)/(d^2*e)) - 1
/2*b*g*n*(1/(e^3*x + d*e^2) + log(e*x + d)/(d*e^2) - log(x)/(d*e^2)) - 1/2*
(2*e*x + d)*b*g*log(c*x^n)/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 1/2*(2*e*x + d
)*a*g/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 1/2*b*f*log(c*x^n)/(e^3*x^2 + 2*d*e
^2*x + d^2*e) - 1/2*a*f/(e^3*x^2 + 2*d*e^2*x + d^2*e)
```

mupad [B] time = 4.00, size = 174, normalized size = 1.51

$$-\frac{a\,d\,g+a\,e\,f+\frac{x\left(2\,a\,d\,e\,g-b\,e^{2}\,f\,n+b\,d\,e\,g\,n\right)}{d}+b\,d\,g\,n-b\,e\,f\,n}{2\,d^{2}\,e^{2}+4\,d\,e^{3}\,x+2\,e^{4}\,x^{2}}-\frac{\ln\left(c\,x^{n}\right)\left(\frac{b\,f}{2\,e}+\frac{b\,d\,g}{2\,e^{2}}+\frac{b\,g\,x}{e}\right)}{d^{2}+2\,d\,e\,x+e^{2}\,x^{2}}-\frac{b\,n\,\mathrm{atanh}\left(\frac{b\,n\left(d\,g+e\,f\right)\left(d+2\,e\right.}{d\left(b\,d\,g\,n+b\,e\,f\,n\right)}\right.}{d^{2}\,e^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f + g*x)*(a + b*log(c*x^n)))/(d + e*x)^3,x)
```

```
[Out] - (a*d*g + a*e*f + (x*(2*a*d*e*g - b*e^2*f*n + b*d*e*g*n))/d + b*d*g*n - b*
e*f*n)/(2*d^2*e^2 + 2*e^4*x^2 + 4*d*e^3*x) - (log(c*x^n)*((b*f)/(2*e) + (b*
d*g)/(2*e^2) + (b*g*x)/e))/(d^2 + e^2*x^2 + 2*d*e*x) - (b*n*atanh((b*n*(d*g
 + e*f)*(d + 2*e*x))/(d*(b*d*g*n + b*e*f*n)))*(d*g + e*f))/(d^2*e^2)
```

sympy [A] time = 8.30, size = 1090, normalized size = 9.48

$$\begin{cases} \tilde{\infty}\left(-\frac{af}{2x^2}-\frac{ag}{x}-\frac{bfn\log(x)}{2x^2}-\frac{bfn}{4x^2}-\frac{bf\log(c)}{2x^2}-\frac{bgn\log(x)}{x}-\frac{bgn}{x}-\frac{bg\log(c)}{x}\right) \\ \frac{-\frac{af}{2x^2}-\frac{ag}{x}-\frac{bfn\log(x)}{2x^2}-\frac{bfn}{4x^2}-\frac{bf\log(c)}{2x^2}-\frac{bgn\log(x)}{x}-\frac{bgn}{x}-\frac{bg\log(c)}{x}}{e^3} \\ \frac{afx+\frac{agx^2}{2}+bfnx\log(x)-bfnx+bfx\log(c)+\frac{bgnx^2\log(x)}{2}-\frac{bgnx^2}{4}+\frac{bgx^2\log(c)}{2}}{d^3} \\ -\frac{ad^3g}{2d^4e^2+4d^3e^3x+2d^2e^4x^2}-\frac{ad^2ef}{2d^4e^2+4d^3e^3x+2d^2e^4x^2}-\frac{2ad^2egx}{2d^4e^2+4d^3e^3x+2d^2e^4x^2}-\frac{bd^3gn\log\left(\frac{d}{e}+x\right)}{2d^4e^2+4d^3e^3x+2d^2e^4x^2}-\frac{bd^3gn}{2d^4e^2+4d^3e^3x+2d^2e^4x^2}-\frac{b}{2d^4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*ln(c*x**n))/(e*x+d)**3,x)
```

```
[Out] Piecewise((zoo*(-a*f/(2*x**2) - a*g/x - b*f*n*log(x)/(2*x**2) - b*f*n/(4*x*
*2) - b*f*log(c)/(2*x**2) - b*g*n*log(x)/x - b*g*n/x - b*g*log(c)/x), Eq(d,
 0) & Eq(e, 0)), ((-a*f/(2*x**2) - a*g/x - b*f*n*log(x)/(2*x**2) - b*f*n/(4
*x**2) - b*f*log(c)/(2*x**2) - b*g*n*log(x)/x - b*g*n/x - b*g*log(c)/x)/e**
3, Eq(d, 0)), ((a*f*x + a*g*x**2/2 + b*f*n*x*log(x) - b*f*n*x + b*f*x*log(c
) + b*g*n*x**2*log(x)/2 - b*g*n*x**2/4 + b*g*x**2*log(c)/2)/d**3, Eq(e, 0))
, (-a*d**3*g/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - a*d**2*e*f/
(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - 2*a*d**2*e*g*x/(2*d**4*e
**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - b*d**3*g*n*log(d/e + x)/(2*d**4*e
**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - b*d**3*g*n/(2*d**4*e**2 + 4*d**3*
e**3*x + 2*d**2*e**4*x**2) - b*d**2*e*f*n*log(d/e + x)/(2*d**4*e**2 + 4*d**
3*e**3*x + 2*d**2*e**4*x**2) + b*d**2*e*f*n/(2*d**4*e**2 + 4*d**3*e**3*x +
2*d**2*e**4*x**2) - 2*b*d**2*e*g*n*x*log(d/e + x)/(2*d**4*e**2 + 4*d**3*e**
3*x + 2*d**2*e**4*x**2) - b*d**2*e*g*n*x/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d
**2*e**4*x**2) + 2*b*d*e**2*f*n*x*log(x)/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d
**2*e**4*x**2) - 2*b*d*e**2*f*n*x*log(d/e + x)/(2*d**4*e**2 + 4*d**3*e**3*x
 + 2*d**2*e**4*x**2) + b*d*e**2*f*n*x/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2
*e**4*x**2) + 2*b*d*e**2*f*x*log(c)/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e
**4*x**2) + b*d*e**2*g*n*x**2*log(x)/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*
e**4*x**2) - b*d*e**2*g*n*x**2*log(d/e + x)/(2*d**4*e**2 + 4*d**3*e**3*x +
2*d**2*e**4*x**2) + b*d*e**2*g*x**2*log(c)/(2*d**4*e**2 + 4*d**3*e**3*x + 2
*d**2*e**4*x**2) + b*e**3*f*n*x**2*log(x)/(2*d**4*e**2 + 4*d**3*e**3*x + 2*
d**2*e**4*x**2) - b*e**3*f*n*x**2*log(d/e + x)/(2*d**4*e**2 + 4*d**3*e**3*x
 + 2*d**2*e**4*x**2) + b*e**3*f*x**2*log(c)/(2*d**4*e**2 + 4*d**3*e**3*x +
2*d**2*e**4*x**2), True))
```

3.455 $\int \frac{(f+gx)\left(a+b\log(cx^n)\right)^2}{(d+ex)^3}\,dx$

Optimal. Leaf size=202

$$-\frac{bn(dg+ef)\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right)}{d^2e^2}+\frac{f^2\left(a+b\log(cx^n)\right)^2}{2d^2(ef-dg)}-\frac{bnx(ef-dg)\left(a+b\log(cx^n)\right)}{d^2e(d+ex)}-\frac{(f+gx)^2\left(a+\right.}{2(d+ex)^2}$$

```
[Out] -b*(-d*g+e*f)*n*x*(a+b*ln(c*x^n))/d^2/e/(e*x+d)+1/2*f^2*(a+b*ln(c*x^n))^2/d
^2/(-d*g+e*f)-1/2*(g*x+f)^2*(a+b*ln(c*x^n))^2/(-d*g+e*f)/(e*x+d)^2+b^2*(-d*
g+e*f)*n^2*ln(e*x+d)/d^2/e^2-b*(d*g+e*f)*n*(a+b*ln(c*x^n))*ln(1+e*x/d)/d^2/
e^2-b^2*(d*g+e*f)*n^2*polylog(2,-e*x/d)/d^2/e^2
```

Rubi [A] time = 0.41, antiderivative size = 278, normalized size of antiderivative = 1.38, number of steps used = 13, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {2357, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 2318}

$$-\frac{b^2n^2(ef-dg)\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2e^2}-\frac{2b^2gn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{de^2}-\frac{bn(ef-dg)\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right)}{d^2e^2}+\frac{(ef-dg}{}$$

Antiderivative was successfully verified.

```
[In] Int[((f + g*x)*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] -((b*(e*f - d*g)*n*x*(a + b*Log[c*x^n]))/(d^2*e*(d + e*x))) + ((e*f - d*g)*
(a + b*Log[c*x^n])^2)/(2*d^2*e^2) - ((e*f - d*g)*(a + b*Log[c*x^n])^2)/(2*e
^2*(d + e*x)^2) + (g*x*(a + b*Log[c*x^n])^2)/(d*e*(d + e*x)) + (b^2*(e*f -
d*g)*n^2*Log[d + e*x])/(d^2*e^2) - (2*b*g*n*(a + b*Log[c*x^n])*Log[1 + (e*x
)/d])/(d*e^2) - (b*(e*f - d*g)*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(d^2*
e^2) - (2*b^2*g*n^2*PolyLog[2, -((e*x)/d)])/(d*e^2) - (b^2*(e*f - d*g)*n^2*
PolyLog[2, -((e*x)/d)])/(d^2*e^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2357

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] :> With[{
u = ExpandIntegrand[(a + b*Log[c*x^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /
; FreeQ[{a, b, c, n}, x] && RationalFunctionQ[RFx, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(f+gx)\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^3}\,dx = \int \left(\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^3}+\frac{g\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^2}\right)dx$$

$$= \frac{g\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^2}dx}{e}+\frac{(ef-dg)\int \frac{\left(a+b\log(cx^n)\right)^2}{(d+ex)^3}dx}{e}$$

$$= -\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2}+\frac{gx\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)}-\frac{(2bgn)\int \frac{a+b\log(cx^n)}{d+ex}dx}{de}$$

$$= -\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2}+\frac{gx\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)}-\frac{2bgn\left(a+b\log\left(cx^n\right)\right)}{de^2}$$

$$= -\frac{b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)}{d^2e(d+ex)}-\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2}+\frac{gx\left(a+b\log\right.}{de(d+}$$

$$= -\frac{b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)}{d^2e(d+ex)}+\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e^2}-\frac{(ef-dg)\left(a\right.}{2e^2(}$$

$$= -\frac{b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)}{d^2e(d+ex)}+\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e^2}-\frac{(ef-dg)\left(a\right.}{2e^2(}$$

Mathematica [A] time = 0.25, size = 244, normalized size = 1.21

$$\frac{\frac{(ef-dg)\left(-2bn(d+ex)\log\left(\frac{ex}{d}+1\right)\left(a+b\log(cx^n)\right)+(d+ex)\left(a+b\log(cx^n)\right)^2+2bdn\left(a+b\log(cx^n)\right)-2b^2n^2(d+ex)\mathrm{Li}_2\left(-\frac{ex}{d}\right)-2b^2n^2(d+ex)(\log(x)-\log(d+ex))\right)}{d^2(d+ex)}}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f + g*x)*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] (-(((e*f - d*g)*(a + b*Log[c*x^n])^2)/(d + e*x)^2) - (2*g*(a + b*Log[c*x^n]
)^2)/(d + e*x) + (2*g*((a + b*Log[c*x^n])*(a + b*Log[c*x^n] - 2*b*n*Log[1 +
 (e*x)/d]) - 2*b^2*n^2*PolyLog[2, -((e*x)/d)]))/d + ((e*f - d*g)*(2*b*d*n*(
a + b*Log[c*x^n]) + (d + e*x)*(a + b*Log[c*x^n])^2 - 2*b^2*n^2*(d + e*x)*(L
og[x] - Log[d + e*x]) - 2*b*n*(d + e*x)*(a + b*Log[c*x^n])*Log[1 + (e*x)/d]
 - 2*b^2*n^2*(d + e*x)*PolyLog[2, -((e*x)/d)]))/(d^2*(d + e*x)))/(2*e^2)
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{a^2gx+a^2f+\left(b^2gx+b^2f\right)\log\left(cx^n\right)^2+2\left(abgx+abf\right)\log\left(cx^n\right)}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*log(c*x^n)^2 + 2*(a*b*g*x + a
*b*f)*log(c*x^n))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)\left(b\log\left(cx^n\right)+a\right)^2}{\left(ex+d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)*(b*log(c*x^n) + a)^2/(e*x + d)^3, x)
```

maple [C] time = 0.39, size = 2163, normalized size = 10.71

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(b*ln(c*x^n)+a)^2/(e*x+d)^3,x)
```

```
[Out] 1/4*(-I*Pi*b*csgn(I*c)*csgn(I*x^n)*csgn(I*c*x^n)+I*Pi*b*csgn(I*c)*csgn(I*c*
x^n)^2+I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*csgn(I*c*x^n)^3+2*b*ln(c)+
2*a)^2*(-1/2*(-d*g+e*f)/e^2/(e*x+d)^2-g/e^2/(e*x+d))-I/e^2*ln(x^n)/(e*x+d)*
g*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*ln(x^n)/e/(e*x+d)^2*f*b^2*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(x^n)/e/(e*x+d)^2*f*b^2*Pi*csgn(I*c*x^n)^2*c
sgn(I*c)-1/2*I/e^2*n/d*ln(e*x+d)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I/e^2
*ln(x^n)/(e*x+d)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+b*ln(x^n)/e^2
/(e*x+d)^2*d*g*a+b/e*n/d/(e*x+d)*f*a+b/e^2*n/d*ln(x)*g*a+b/e*n/d^2*ln(x)*f*
a-b/e^2*n/d*ln(e*x+d)*g*a-1/2*I*ln(x^n)/e^2/(e*x+d)^2*d*g*b^2*Pi*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)+1/2*I/e^2*n/d*ln(x)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2+1/2*I/e^2*n/d*ln(x)*g*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I/e*n/d/
(e*x+d)*f*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I/e*n/d/(e*x+d)*f*b^2*Pi*c
sgn(I*c*x^n)^2*csgn(I*c)+1/2*I*ln(x^n)/e^2/(e*x+d)^2*d*g*b^2*Pi*csgn(I*c*x^
n)^2*csgn(I*c)+1/2*I*ln(x^n)/e/(e*x+d)^2*f*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)+1/2*I/e^2*n/(e*x+d)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
+b^2*n/e^2*ln(x^n)/d*ln(x)*g+b^2*n/e*ln(x^n)/d^2*ln(x)*f+b^2*n/e*ln(x^n)/d/
(e*x+d)*f-1/2*I/e*n/d^2*ln(x)*f*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+
1/2*I/e^2*n/d*ln(e*x+d)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-b/e*n/
d^2*ln(e*x+d)*f*a+I/e^2*ln(x^n)/(e*x+d)*g*b^2*Pi*csgn(I*c*x^n)^3-I/e^2*ln(x
^n)/(e*x+d)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I/e*n/d^2*ln(e*x+d)*f*
b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*ln(x^n)/e^2/(e*x+d)^2*d*g*b^2*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2+1/2*I/e*n/d^2*ln(e*x+d)*f*b^2*Pi*csgn(I*c*x^n)^3-1
/2*I/e^2*n/(e*x+d)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I/e*n/d^2*ln(e*
x+d)*f*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*ln(x^n)/e/(e*x+d)^2*f*b^2*P
i*csgn(I*c*x^n)^3+1/2*I/e^2*n/(e*x+d)*g*b^2*Pi*csgn(I*c*x^n)^3-1/2*b^2*ln(x
^n)^2/e/(e*x+d)^2*f-1/2*I/e^2*n/d*ln(e*x+d)*g*b^2*Pi*csgn(I*c*x^n)^2*csgn(I
*c)+1/2*I/e*n/d^2*ln(e*x+d)*f*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/
2*I/e^2*n/(e*x+d)*g*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*ln(x^n)/e^2/(e*x
+d)^2*d*g*b^2*Pi*csgn(I*c*x^n)^3+1/2*I/e*n/d^2*ln(x)*f*b^2*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)^2+1/2*I/e*n/d^2*ln(x)*f*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I
/e*n/d^2*ln(x)*f*b^2*Pi*csgn(I*c*x^n)^3+1/2*I/e^2*n/d*ln(e*x+d)*g*b^2*Pi*cs
gn(I*c*x^n)^3-b^2*ln(x^n)^2*g/e^2/(e*x+d)-1/2*I/e*n/d/(e*x+d)*f*b^2*Pi*csgn
(I*c*x^n)^3-1/2*I/e^2*n/d*ln(x)*g*b^2*Pi*csgn(I*c*x^n)^3-b^2*n/e^2*ln(x^n)/
d*ln(e*x+d)*g-b^2*n/e*ln(x^n)/d^2*ln(e*x+d)*f-1/e^2*n/(e*x+d)*g*b^2*ln(c)-b
/e^2*n/(e*x+d)*g*a-1/2*b^2/e^2*n^2/d*ln(x)^2*g-1/2*b^2/e*n^2/d^2*ln(x)^2*f+
b^2/e^2*n^2/d*ln(x)*g-b^2/e*n^2/d^2*ln(x)*f-b^2/e^2*n^2/d*ln(e*x+d)*g+b^2/e
*n^2/d^2*ln(e*x+d)*f+b^2/e^2*n^2/d*dilog(-1/d*e*x)*g+b^2/e*n^2/d^2*dilog(-1
/d*e*x)*f-2/e^2*ln(x^n)/(e*x+d)*g*b^2*ln(c)-2*b/e^2*ln(x^n)/(e*x+d)*g*a-b*l
n(x^n)/e/(e*x+d)^2*f*a+1/2*b^2*ln(x^n)^2/e^2/(e*x+d)^2*d*g-b^2*n/e^2*ln(x^n
)/(e*x+d)*g-ln(x^n)/e/(e*x+d)^2*f*b^2*ln(c)+b^2/e^2*n^2/d*ln(e*x+d)*ln(-1/d
*e*x)*g+b^2/e*n^2/d^2*ln(e*x+d)*ln(-1/d*e*x)*f-1/2*I/e*n/d/(e*x+d)*f*b^2*Pi
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I/e^2*n/d*ln(x)*g*b^2*Pi*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+ln(x^n)/e^2/(e*x+d)^2*d*g*b^2*ln(c)+1/e^2*n/d*ln
(x)*g*b^2*ln(c)+1/e*n/d^2*ln(x)*f*b^2*ln(c)-1/e^2*n/d*ln(e*x+d)*g*b^2*ln(c)
-1/e*n/d^2*ln(e*x+d)*f*b^2*ln(c)+1/e*n/d/(e*x+d)*f*b^2*ln(c)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$abfn\left(\frac{1}{de^2x+d^2e}-\frac{\log(ex+d)}{d^2e}+\frac{\log(x)}{d^2e}\right)-abgn\left(\frac{1}{e^3x+de^2}+\frac{\log(ex+d)}{de^2}-\frac{\log(x)}{de^2}\right)-\frac{(2\,ex+d)abg\log(cx^n)}{e^4x^2+2\,de^3x+d^2e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] a*b*f*n*(1/(d*e^2*x + d^2*e) - log(e*x + d)/(d^2*e) + log(x)/(d^2*e)) - a*b
*g*n*(1/(e^3*x + d*e^2) + log(e*x + d)/(d*e^2) - log(x)/(d*e^2)) - (2*e*x +
 d)*a*b*g*log(c*x^n)/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 1/2*(2*e*x + d)*a^2*
g/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - a*b*f*log(c*x^n)/(e^3*x^2 + 2*d*e^2*x +
 d^2*e) - 1/2*a^2*f/(e^3*x^2 + 2*d*e^2*x + d^2*e) - 1/2*(2*b^2*e*g*x + (e*f
 + d*g)*b^2)*log(x^n)^2/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) + integrate((b^2*e^
2*g*x^2*log(c)^2 + b^2*e^2*f*x*log(c)^2 + (2*(e^2*g*n + e^2*g*log(c))*b^2*x
^2 + (e^2*f*n + 3*d*e*g*n + 2*e^2*f*log(c))*b^2*x + (d*e*f*n + d^2*g*n)*b^2
)*log(x^n))/(e^5*x^4 + 3*d*e^4*x^3 + 3*d^2*e^3*x^2 + d^3*e^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(f+g\,x\right)\,{\left(a+b\,\ln\left(c\,x^n\right)\right)}^2}{{\left(d+e\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f + g*x)*(a + b*log(c*x^n))^2)/(d + e*x)^3,x)
```

```
[Out] int(((f + g*x)*(a + b*log(c*x^n))^2)/(d + e*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \log{\left(c x^{n} \right)}\right)^{2} \left(f + g x\right)}{\left(d + e x\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*ln(c*x**n))**2/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2*(f + g*x)/(d + e*x)**3, x)
```

3.456 $\int \frac{(f+gx)\left(a+b\log(cx^n)\right)^3}{(d+ex)^3}\,dx$

Optimal. Leaf size=295

$$-\frac{3b^2n^2(dg+ef)\mathrm{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2e^2}+\frac{3b^2n^2(ef-dg)\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2e^2}-\frac{3bn(dg+ef)\log\left(\right.}{}$$

```
[Out] -3/2*b*(-d*g+e*f)*n*x*(a+b*ln(c*x^n))^2/d^2/e/(e*x+d)+1/2*f^2*(a+b*ln(c*x^n
))^3/d^2/(-d*g+e*f)-1/2*(g*x+f)^2*(a+b*ln(c*x^n))^3/(-d*g+e*f)/(e*x+d)^2+3*
b^2*(-d*g+e*f)*n^2*(a+b*ln(c*x^n))*ln(1+e*x/d)/d^2/e^2-3/2*b*(d*g+e*f)*n*(a
+b*ln(c*x^n))^2*ln(1+e*x/d)/d^2/e^2+3*b^3*(-d*g+e*f)*n^3*polylog(2,-e*x/d)/
d^2/e^2-3*b^2*(d*g+e*f)*n^2*(a+b*ln(c*x^n))*polylog(2,-e*x/d)/d^2/e^2+3*b^3
*(d*g+e*f)*n^3*polylog(3,-e*x/d)/d^2/e^2
```

Rubi [A] time = 0.62, antiderivative size = 408, normalized size of antiderivative = 1.38, number of steps used = 17, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {2357, 2319, 2347, 2344, 2302, 30, 2317, 2374, 6589, 2318, 2391}

$$-\frac{3b^2n^2(ef-dg)\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{d^2e^2}-\frac{6b^2gn^2\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{de^2}+\frac{3b^3n^3(ef-d}{}$$

Antiderivative was successfully verified.

```
[In] Int[((f + g*x)*(a + b*Log[c*x^n])^3)/(d + e*x)^3,x]
```

```
[Out] (-3*b*(e*f - d*g)*n*x*(a + b*Log[c*x^n])^2)/(2*d^2*e*(d + e*x)) + ((e*f - d
*g)*(a + b*Log[c*x^n])^3)/(2*d^2*e^2) - ((e*f - d*g)*(a + b*Log[c*x^n])^3)/
(2*e^2*(d + e*x)^2) + (g*x*(a + b*Log[c*x^n])^3)/(d*e*(d + e*x)) + (3*b^2*(
e*f - d*g)*n^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(d^2*e^2) - (3*b*g*n*(a
 + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/(d*e^2) - (3*b*(e*f - d*g)*n*(a + b*Lo
g[c*x^n])^2*Log[1 + (e*x)/d])/(2*d^2*e^2) + (3*b^3*(e*f - d*g)*n^3*PolyLog[
2, -((e*x)/d)])/(d^2*e^2) - (6*b^2*g*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((e
*x)/d)])/(d*e^2) - (3*b^2*(e*f - d*g)*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((
e*x)/d)])/(d^2*e^2) + (6*b^3*g*n^3*PolyLog[3, -((e*x)/d)])/(d*e^2) + (3*b^3
*(e*f - d*g)*n^3*PolyLog[3, -((e*x)/d)])/(d^2*e^2)
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
```

```
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2357

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] :> With[{
u = ExpandIntegrand[(a + b*Log[c*x^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /
; FreeQ[{a, b, c, n}, x] && RationalFunctionQ[RFx, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(f+gx)\left(a+b\log\left(cx^n\right)\right)^3}{(d+ex)^3}dx = \int \left(\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{e(d+ex)^3} + \frac{g\left(a+b\log\left(cx^n\right)\right)^3}{e(d+ex)^2}\right)dx$$

$$= \frac{g\int \frac{\left(a+b\log(cx^n)\right)^3}{(d+ex)^2}dx}{e} + \frac{(ef-dg)\int \frac{\left(a+b\log(cx^n)\right)^3}{(d+ex)^3}dx}{e}$$

$$= -\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2e^2(d+ex)^2} + \frac{gx\left(a+b\log\left(cx^n\right)\right)^3}{de(d+ex)} - \frac{(3bgn)\int \frac{\left(a+b\log(cx^n)\right)^2}{d+ex}}{de}$$

$$= -\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2e^2(d+ex)^2} + \frac{gx\left(a+b\log\left(cx^n\right)\right)^3}{de(d+ex)} - \frac{3bgn\left(a+b\log(cx\right.}{de^2}$$

$$= -\frac{3b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e(d+ex)} - \frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2e^2(d+ex)^2} + \frac{gx\left(a+\right.}{de}$$

$$= -\frac{3b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e(d+ex)} - \frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2e^2(d+ex)^2} + \frac{gx\left(a+\right.}{de}$$

$$= -\frac{3b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e(d+ex)} + \frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2d^2e^2} - \frac{(ef-d}{}$$

$$= -\frac{3b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e(d+ex)} + \frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2d^2e^2} - \frac{(ef-d}{}$$

Mathematica [A] time = 0.39, size = 339, normalized size = 1.15

$$\frac{(ef-dg)\left(-3bn(d+ex)\left(\left(a+b\log(cx^n)\right)\left(a+b\log(cx^n)-2bn\log\left(\frac{ex}{d}+1\right)\right)-2b^2n^2\text{Li}_2\left(-\frac{ex}{d}\right)\right)-6b^2n^2(d+ex)\left(\text{Li}_2\left(-\frac{ex}{d}\right)\left(a+b\log(cx^n)\right)-bn\text{Li}_3\left(-\frac{ex}{d}\right)\right)+(d+ex)}{d^2(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f + g*x)*(a + b*Log[c*x^n])^3)/(d + e*x)^3,x]
```

```
[Out] (-(((e*f - d*g)*(a + b*Log[c*x^n])^3)/(d + e*x)^2) - (2*g*(a + b*Log[c*x^n]
)^3)/(d + e*x) + (2*g*((a + b*Log[c*x^n])^2*(a + b*Log[c*x^n] - 3*b*n*Log[1
 + (e*x)/d]) - 6*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 6*b^3*
n^3*PolyLog[3, -((e*x)/d)]))/d + ((e*f - d*g)*(3*b*d*n*(a + b*Log[c*x^n])^2
 + (d + e*x)*(a + b*Log[c*x^n])^3 - 3*b*n*(d + e*x)*(a + b*Log[c*x^n])^2*Lo
g[1 + (e*x)/d] - 3*b*n*(d + e*x)*((a + b*Log[c*x^n])*(a + b*Log[c*x^n] - 2*
b*n*Log[1 + (e*x)/d]) - 2*b^2*n^2*PolyLog[2, -((e*x)/d)]) - 6*b^2*n^2*(d +
e*x)*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x)/d)
])))/(d^2*(d + e*x)))/(2*e^2)
```

fricas [F] time = 0.73, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^3gx + a^3f + \left(b^3gx + b^3f\right)\log\left(cx^n\right)^3 + 3\left(ab^2gx + ab^2f\right)\log\left(cx^n\right)^2 + 3\left(a^2bgx + a^2bf\right)\log\left(cx^n\right)}{e^3x^3 + 3\,de^2x^2 + 3\,d^2ex + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^3/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((a^3*g*x + a^3*f + (b^3*g*x + b^3*f)*log(c*x^n)^3 + 3*(a*b^2*g*x +
 a*b^2*f)*log(c*x^n)^2 + 3*(a^2*b*g*x + a^2*b*f)*log(c*x^n))/(e^3*x^3 + 3*d
*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)\left(b\log\left(cx^{n}\right)+a\right)^{3}}{\left(ex+d\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^3/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)*(b*log(c*x^n) + a)^3/(e*x + d)^3, x)
```

maple [F] time = 1.75, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)\left(b\ln\left(c\,x^{n}\right)+a\right)^{3}}{\left(ex+d\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(b*ln(c*x^n)+a)^3/(e*x+d)^3,x)
```

```
[Out] int((g*x+f)*(b*ln(c*x^n)+a)^3/(e*x+d)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{3}{2}a^{2}bfn\left(\frac{1}{de^{2}x+d^{2}e}-\frac{\log\left(ex+d\right)}{d^{2}e}+\frac{\log(x)}{d^{2}e}\right)-\frac{3}{2}a^{2}bgn\left(\frac{1}{e^{3}x+de^{2}}+\frac{\log\left(ex+d\right)}{de^{2}}-\frac{\log(x)}{de^{2}}\right)-\frac{3\left(2\,ex+d\right)a^{2}bg\log}{2\left(e^{4}x^{2}+2\,de^{3}x+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^3/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] 3/2*a^2*b*f*n*(1/(d*e^2*x + d^2*e) - log(e*x + d)/(d^2*e) + log(x)/(d^2*e))
 - 3/2*a^2*b*g*n*(1/(e^3*x + d*e^2) + log(e*x + d)/(d*e^2) - log(x)/(d*e^2)
) - 3/2*(2*e*x + d)*a^2*b*g*log(c*x^n)/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 1/
2*(2*e*x + d)*a^3*g/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 3/2*a^2*b*f*log(c*x^n
)/(e^3*x^2 + 2*d*e^2*x + d^2*e) - 1/2*a^3*f/(e^3*x^2 + 2*d*e^2*x + d^2*e) -
 1/2*(2*b^3*e*g*x + (e*f + d*g)*b^3)*log(x^n)^3/(e^4*x^2 + 2*d*e^3*x + d^2*
e^2) + integrate(1/2*(2*(b^3*e^2*g*log(c)^3 + 3*a*b^2*e^2*g*log(c)^2)*x^2 +
 3*((d*e*f*n + d^2*g*n)*b^3 + 2*(a*b^2*e^2*g + (e^2*g*n + e^2*g*log(c))*b^3
)*x^2 + (2*a*b^2*e^2*f + (e^2*f*n + 3*d*e*g*n + 2*e^2*f*log(c))*b^3)*x)*log
(x^n)^2 + 2*(b^3*e^2*f*log(c)^3 + 3*a*b^2*e^2*f*log(c)^2)*x + 6*((b^3*e^2*g
*log(c)^2 + 2*a*b^2*e^2*g*log(c))*x^2 + (b^3*e^2*f*log(c)^2 + 2*a*b^2*e^2*f
*log(c))*x)*log(x^n))/(e^5*x^4 + 3*d*e^4*x^3 + 3*d^2*e^3*x^2 + d^3*e^2*x),
x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(f+g\,x\right)\,{\left(a+b\,\ln\left(c\,x^{n}\right)\right)}^{3}}{{\left(d+e\,x\right)}^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f + g*x)*(a + b*log(c*x^n))^3)/(d + e*x)^3,x)
```

```
[Out] int(((f + g*x)*(a + b*log(c*x^n))^3)/(d + e*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\log\left(cx^{n}\right)\right)^{3}\left(f+gx\right)}{\left(d+ex\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*ln(c*x**n))**3/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))**3*(f + g*x)/(d + e*x)**3, x)
```

Chapter 4

Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.0.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*          GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]


(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
```

```
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]
```

```
AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.0.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems

GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,
   debug:=false;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);

      if debug then
         print("ExpnType_result",ExpnType_result," ExpnType_optimal=",
   ExpnType_optimal);
      fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

  #This check below actually is not needed, since I only
  #call this grading only for passed integrals. i.e. I check
  #for "F" before calling this. But no harm of keeping it here.
  #just in case.


  if not type(result,freeof('int')) then
     return "F";
  end if;


  if ExpnType_result<=ExpnType_optimal then
      if debug then
          print("ExpnType_result<=ExpnType_optimal");
      fi;
```

```
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            if debug then
               print("both result and optimal complex");
            fi;
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            if debug then
               print("result contains complex but optimal is not");
            fi;
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
           if debug then
               print("result do not contain complex, this assumes optimal do
   not as well");
           fi;
           if leaf_count_result<=2*leaf_count_optimal then
              if debug then
                 print("leaf_count_result<=2*leaf_count_optimal");
              fi;
              return "A";
           else
              if debug then
                 print("leaf_count_result>2*leaf_count_optimal");
              fi;
              return "B";
           end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      if debug then
         print("ExpnType(result) > ExpnType(optimal)");
      fi;
      return "C";
  end if

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
```

```
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:
```

```
AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.0.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]
```

```
def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
           return True
        else:
           return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn
   )))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,
   ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or
   type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,
   expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType
   ,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9
```

```
#main function
def grade_antiderivative(result,optimal):

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        return "F"

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
   well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```

4.0.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#              Albert Rich to use with Sagemath. This is used to
#              grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#              'arctan2','floor','abs','log_integral'

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
```

```
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    debug=False
    if debug: print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','
   sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e',
           'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','
   hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in
   sagemath

def is_atom(expn):

    debug=False
    if debug: print ("Enter is_atom")


    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-
   sagemath-equivalent-to-atomic-type-in-maple/
    try:
        if expn.parent() is SR:
```

```
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens")
    :
            return expn in expn.parent().base_ring() or expn in expn.parent().
    gens()
        return False

    except AttributeError as error:
        return False


def expnType(expn):

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],
    Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.
    args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:  #isinstance(expn.args[1],Integer
    )
            return expnType(expn.operands()[0])   #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],
    Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],
    Rational)
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(
    expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()
    [1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #
    isinstance(expn,Add) or isinstance(expn,Mul)
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn
    .func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(
    expn.args)))
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): #
    is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
```

```
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    if debug: print ("Enter grade_antiderivative for sagemath")

    leaf_count_result  = tree_size(result) #leaf_count(result)
    leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

    if debug: print ("leaf_count_result=", leaf_count_result, "
    leaf_count_optimal=",leaf_count_optimal)


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",
    expnType_optimal)

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
    well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```